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PREHISTORIC LAND UTILIZATION OF THE  
DECKER AREA, SOUTHEASTERN MONTANA

By

Richard Allan Fox

B.A., University of Montana, 1966

Presented in partial fulfillment of  
the requirements for the degree of

Master of Arts

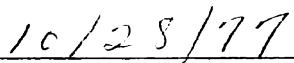
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## ABSTRACT

Fox, Richard Allan, M.A., <sup>Dec.</sup>~~August~~ 1977

Anthropology

Prehistoric Land Utilization of the Decker Area, Southeastern Montana (279 pp.)

Director: Dee C. Taylor *DC*

Prehistoric human occupation of the Decker area, Southeastern Montana may be evaluated through the use of an eco-zonal model. The purpose of this study was to note associations and regularities between archaeological sites and eco-zone preferences through time.

Seven eco-zones were identified in the Spring Creek Mine Project area. They are common to the entire Decker area and include lowland zones (Creek Bottom, Creek Terrace and Lower Slope Fan/Terrace) and upland zones (Scoria/Sandstone, Dry Slope Ponderosa Pine, Moist Slope Ponderosa Pine, and Upland Prairie). Archaeological sites were differentiated according to site type and assigned to a temporal category through the use of artifact typologies and radiocarbon dates. Sites were then assigned to a particular eco-zone and regularities between site type and eco-zone preferences through time were observed.

It was discovered that three types of archaeological sites exhibited locational regularities based upon eco-zone selection criteria. Generally, occupation, lithic scatter and chipping station site types assigned to late Big Game Hunter and Early Archaic times occurred predominantly in upland zones while Late Archaic Period sites of the same types crosscut the entire eco-zone assemblage. Late Hunter Period occupation sites also occurred throughout a variety of eco-zones. This phenomenon was attributed to seasonal utilization of the area within a transhumant subsistence cycle. The transhumant cycle seems to have persisted from at least Early Archaic times.

Other archaeological site types (medicine wheels, rockshelters, quarry sites, vision quests, and petroglyphs) were not located according to eco-zone preferences.

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This thesis is the culmination of a series of events that began in 1974 when I decided to leave a well-paying professional career to study archaeology. It was a good decision that was fostered by Dr. Larry Loendorf as he "rekindled" my interests in prehistory. Thanks!

Thanks also to the members of my faculty committee, Dr. Carling Malouf, Dr. Duane Hampton and particularly Dr. Dee Taylor. This analysis arose out of my research in the Decker area. It was made possible by Dr. Taylor.

Several other individuals assisted along the way. Larry Robson and James Beyer helped me in the field. Andy Jackson, Steve Martin and Bill Oelklaus of VTN, Incorporated were very helpful throughout the project. R. C. McConnell helped with the soil analysis. John Taylor spent many hours analyzing faunal remains. Geoff Sutton did the photography and developed the proof sheets.

Data utilized in this analysis were recovered from investigations funded by the Northern Energy Resources Company (NERCO), successor to Pacific Power and Light. Their cooperation was appreciated and gratitude is expressed for the permission to use the data recovered. The project would not have been possible without their financial help.

## CHAPTER I

### INTRODUCTION

#### Area Defined

During the summer of 1976, the Department of Anthropology, through the University of Montana Research Administration, contracted with VTN Engineers, Architects and Planners of Denver, Colorado for archaeological services in the proposed Spring Creek Mine Project area near Decker, Montana. VTN, Inc., represented the Northern Energy Resources Company (NERCO), owner/developer and successor to the original contracting concern, Pacific Power and Light (PP&L). The archaeological project proceeded in two phases, a survey phase and a later test excavation phase. The lands included in the 1976 survey are located approximately seven miles north of Decker in Big Horn County and are described as follows:

Township 8 South, Range 39 East (Montana Principle Meridian)	
Section 13:	the $S\frac{1}{2}$ of the $SW\frac{1}{4}$
Section 14:	the $S\frac{1}{2}$ of the $SW\frac{1}{4}$ and S of the $SE\frac{1}{4}$
Section 15:	$S\frac{1}{2}$
Section 24:	$N\frac{1}{2}$ and the $SE\frac{1}{4}$
Section 36:	all
Township 8 South, Range 40 East	
Section 20:	$S\frac{1}{2}$ of the $SW\frac{1}{4}$ and the $SW\frac{1}{4}$ of the $SE\frac{1}{4}$
Section 26:	$SW\frac{1}{4}$ of the $SW\frac{1}{4}$



- Section 27: all except the  $N\frac{1}{4}$  of the  $SW\frac{1}{4}$  and an irregular portion ( $\frac{1}{2}$ ) of the  $SW\frac{1}{4}$  of the  $SW\frac{1}{4}$  of the  $SW\frac{1}{4}$
- Section 28: all except the  $SE\frac{1}{4}$  of the  $SE\frac{1}{4}$  of the  $SE\frac{1}{4}$  and an irregular portion ( $\frac{1}{2}$ ) of the  $SW\frac{1}{4}$  of the  $SW\frac{1}{4}$  of the  $SE\frac{1}{4}$
- Section 29: all except the  $E\frac{1}{2}$  of the  $SW\frac{1}{4}$  of the  $SW\frac{1}{4}$ ; the  $SE\frac{1}{4}$  of the  $SW\frac{1}{4}$ ;  $W\frac{1}{2}$  of the  $SW\frac{1}{4}$  of the  $SE\frac{1}{4}$ ; and the  $S\frac{1}{2}$  of the  $SE\frac{1}{2}$  of the  $SE\frac{1}{4}$
- Section 31: all
- Section 32: the  $NW\frac{1}{4}$  of the  $NW\frac{1}{4}$  of the  $NW\frac{1}{4}$

These lands are hereafter referred to as the study area. Test excavations were carried out on sites discovered within the study area and on sites discovered on additional acreage as described below.

The proposed Spring Creek Mine acreage also includes portions of the lands surveyed by Haberman (1973) during a 1972 archaeological survey for the Western Interstate Commission for Higher Education. His final report of investigations is entitled 1972 Archaeological Survey in the Decker-Birney Area of Big Horn County, Southeastern Montana. The following portions of that survey are part of the Spring Creek Mine acreage and are, along with the archaeological sites identified within, included in this analysis.

Township 8 South, Range 39 East

- Section 21:  $NW\frac{1}{4}$  and the  $NE\frac{1}{4}$  of the  $NE\frac{1}{4}$ , the  $NE\frac{1}{4}$  of the  $NW\frac{1}{4}$  and  $SE\frac{1}{4}$  of the  $NE\frac{1}{4}$
- Section 22: all
- Section 23: all
- Section 24:  $SW\frac{1}{4}$
- Section 25: all
- Section 26: all except  $S\frac{1}{2}$  of the  $SW\frac{1}{4}$  and the  $SW\frac{1}{4}$  of the  $SE\frac{1}{4}$
- Section 27: all of the  $N\frac{1}{2}$  except the  $SW\frac{1}{4}$  of the  $NW\frac{1}{4}$

Township 8 South, Range 40 East  
Section 30: all

These lands, along with those included in the study area, are hereafter referred to as the project area (see figure 1). Data from the 1976 survey and testing phases and Haberman's 1972 survey are utilized in this thesis. Of the forty-four sites included in the analysis, seven were identified by Haberman (1973).

### Survey Methodology

The 1976 survey crew consisted of two members, Richard Allan Fox (Field Supervisor) and Larry Robson (Field Assistant). Dr. Dee C. Taylor, Department of Anthropology, University of Montana served as Project Director. Field operations began on 18 July 1976 and lasted through 6 August 1976.

Prior to the field survey and in order to become familiar with the regional archaeology, a thorough records review and literature search was initiated and was designed to identify known sites and previous work in or near the study area. These investigations revealed a tripartite cultural chronology into which the archaeology of the Spring Creek Mine Project area seems to fit well. These major prehistoric periods are, from the earliest to the latest, the Big Game Hunter Period, the Archaic Period and the Late Hunter Period (Taylor 1975:23) (see figure 2).

Survey methods were designed for the crew to walk



## NORTHERN PLAINS CULTURAL CHRONOLOGY

CULTURAL PERIOD		DIAGNOSTIC PROJECTILE POINTS	ECONOMIC ACTIVITY
III. LATE HUNTERS (Late Prehistoric Period)	Horse — ca AD 1700 —	Plains side-notch	Horse riding hunters
	Pre-horse — AD 500 —	Prairie side-notch Avonlea	Bison hunters utilizing bison jumps
	Late	Corner-notch Besant Pelican Lake	Bison hunters using bison jumps and traps; seasonal movements, exploi- tation of plant resources
II. ARCHAIC (Middle Prehistoric Period)	Early — 5000 BC —	McKean Duncan Hanna	
I. BIG GAME HUNTERS (Early Prehistoric Period)	Plano — 7000 BC —	Hell Gap Frederick(Angostura) Eden Scottsbluff	Hunters of transi- tional and modern bison; bison traps and pounds
	Folsom — 8000 BC —	Folsom fluted	Hunters, extinct bison
	Llano ca 10000 BC	Clovis	Hunters of mammoth

Figure 2  
(adapted from Taylor 1975)

over and inspect visually 100 percent of all areas where human activity seemed possible. Specifically, a section (or portion thereof) was selected daily and, oriented either north-south or east-west, crew members surveyed by walking parallel to one another while inspecting the surface. The parallel spacing interval was approximately fifty yards apart. At times the rugged and steep topography within the study area forced abandonment of the patterned survey strategy in favor of one that conformed to the natural terrain. In these instances, the survey strategy was to parallel Spring and Pearson Creeks (the major drainages in the project area), walking along ridge tops and creek terraces in regularly spaced intervals. Nearly inaccessible terrain, such as steep slopes, rocky spurs or narrow ridges were surveyed by walking transects across those areas. Prominent hilltops, points of land and knolls were thoroughly investigated. Depending upon the terrain, an intensive survey of four to six hundred acres was completed daily. Thirty man days were spent in the field.

Whenever an archaeological site was discovered, a thorough ground search was conducted in order to determine the nature and extent of cultural materials. The sampling procedure included observation of the lithic debitage and collecting materials within lithic types (e.g., percussion flakes, pressure flakes, cores, etc.) and/or material types (e.g., obsidian, chert, etc.), collecting all observed

artifacts, recovering faunal remains, if any, and recording cultural features. University of Montana Statewide Archaeological Survey forms were utilized to record sites in the field. Color slides and the black and white photographs of each site are noted on the individual site forms and filed in the Anthropology Department records. All sites were assigned Smithsonian Trinomial site numbers and common names. Maps utilized in the field were United States Geological Survey 7.5' Topographical quadrangle maps Pearl School (1967), Half Moon Hill (1967) and Decker (1967).

### Testing Phase

Subsequent to survey investigations, and based upon our recommendations for each site, VTN, Inc. contracted with the Department of Anthropology, University of Montana, to conduct test excavations of specified sites within the Spring Creek Mine Project Area. Of the forty-four sites identified within this acreage, thirteen were investigated further by testing operations. Those sites tested were done on authority from VTN, Inc. Twelve other sites recommended for testing were left intact because we were advised that mining activities would not disturb them. The data from these investigations are included in this analysis.

The test excavation phase began on 4 October 1976 and lasted through 1 November 1976. The field crew consisted of a Field Supervisor, Richard Allan Fox, and a Field

Assistant, James Beyer. Forty-four man days were spent in the field during this phase. Because of the differing nature of each archaeological site our testing phase procedures varied from site to site. In general, however, we located test trenches on those surfaces that contained ample cultural remains.

### Statement of the Problem

Archaeological sites in and surrounding the Spring Creek Mine Project Area occur throughout several ecological and topographic environments. These environments may be classified into a variety of eco-zones. Eco-zones are distinguished by a number of criteria, including floral and faunal resources, soil associations and topography. The eco-zones that are present in the project area include: 1) Creek Bottom; 2) Creek Terrace; 3) Lower Slope Fan/Terrace; 4) Scoria/Sandstone Outcrop; 5) Dry Slope Ponderosa Pine; 6) Moist Slope Ponderosa Pine; and 7) the Upland Prairie zones (see figure 3). It is the purpose of this thesis to investigate and delineate interrelationships between site location (space as an eco-zone concept), site types based upon function, and temporal factors. Temporal matters are considered within the following framework: 1) Big Game Hunter Period (ca. 11000 B.C. 5000 B.C.); 2) Archaic Period (5000 B.C. A.D. 500); and 3) Late Hunter Period (A.D. 500-A.D. 1800).

Specifically, the analysis investigates, utilizing

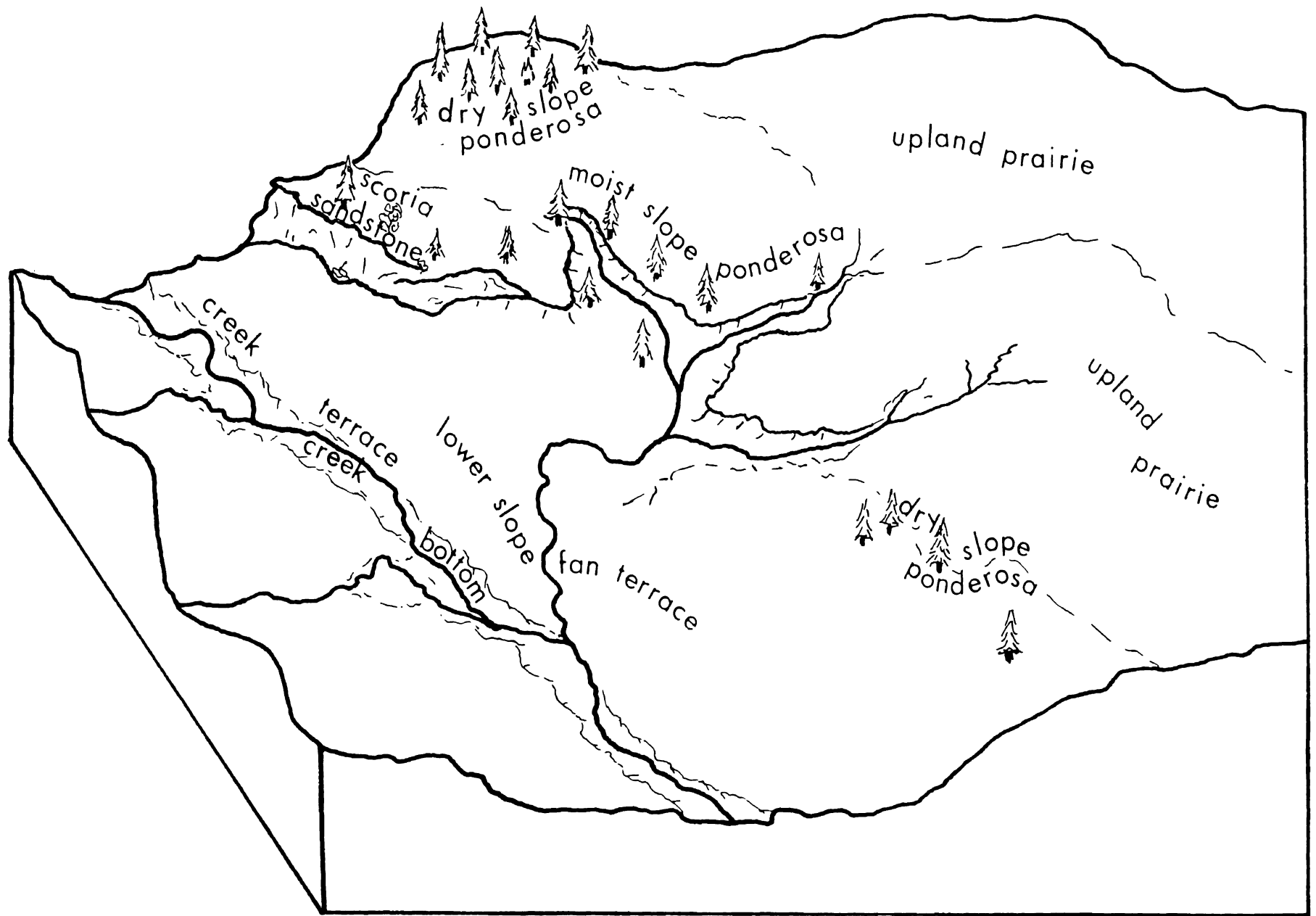


Figure 3. Project area eco-zones; schematic relationships.



the archaeological record and the eco-zone concept, associations between site function and prehistoric land utilization in terms of eco-zone selection throughout the prehistoric time span. The analysis is designed to investigate regularities or preferences in eco-zone selection according to site function for any given time period. This analytical step is then likely to facilitate detection of cultural change in eco-zone preference (if any) through time. Hypotheses involving processes in cultural change may then be formulated.

Some inadequacies in existing models which have been derived from archaeological investigations in the Decker area provide direction for establishing an analytical scheme for investigating patterns in prehistoric utilization of eco-zones through time. Fredlund (1973) devised a predator/prey behavioral model wherein he envisioned Late Hunter Period human movements within an area as a response to food procurement necessities. "Basically, he suggested that early man, like all predators, preferred to use the scoria/sandstone eco-zone as a sheltered area from which to stage hunts onto the creek bottoms and plains" (Beckes 1976:77).

In sum, predator/prey movement patterns are distinct but closely interrelated in that the prey species usually remain on the grassy flats, and the carnivorous ridge dwellers follow a cyclical movement from the ridges and gulches to the basins and back in a twenty-four hour period. Operating within the dynamic pattern of predator/prey interrelationships, prehistoric man successfully developed an efficient hunting-gathering economy, similar in its hunting aspects to that of his predator competitors. Man's only deviation from

the general cycle was that he hunted during the daylight hours (Fredlund 1973:68).

There are several reasons why Fredlund's model appears too simplistic. First, the predator/prey scheme cannot accommodate analyses of those sites and activities that were not associated with hunting activities. Moreover, the model cannot account for the abundance of archaeological sites that are found outside of the scoria/sandstone eco-zone or in contexts dating from earlier temporal periods. Fredlund (1973:68) also implies that the prey species were, for the most part, restricted to the grassy flats within the basins. This premise is not true. Deer and antelope often frequent the upland eco-zones (particularly during the winter months) where juniper browse and sheltered breaks and canyons are available (USDI 1967:4). Beckes' (1976:8) data also suggest that prehistoric man exploited the scoria/sandstone eco-zone, and interfaces of adjacent eco-zones, because of the variety of plant and animal resources found there; not because the zone's location facilitated procurement of game found in other eco-zones. Finally, Beckes (1976:8) noted that the predator/prey model does not incorporate provisions for the exploitation of vegetal resources. This may be due to the paucity of implements associated with vegetal exploitation that characterizes the Decker and surrounding areas. Nevertheless, the model should be able to handle this concept.

Haberman (1973) postulated that the acquisition of the bow and arrow and later the introduction of the horse, along with

concomitant increases in bison, stimulated a change in Decker area settlement patterns. This shift, which began in the neighborhood of 1500 years ago, involved a change in land utilization preferences from upland eco-zones to lowland zones. Haberman's technological-oriented scheme is inadequate for investigations involving specific site function, eco-zonal and temporal regularities and their associations. Specifically, Haberman dealt strictly with altitudinal differences between archaeological sites in assessing prehistoric land utilization patterns through time. Sites with similar elevations (feet MSL) are grouped together into upland or lowland sites. These groupings are inadequate because they fail to account for the fact that any one eco-zone can cross-cut a wide range of elevations. Similarly, a variety of eco-zones can and do exist at any given elevation. In deference to Haberman's ideas, it was noted that certain eco-zones tend to cluster in uplands while others may be regarded as lowland zones. But these generalized categories are based on relative rather than specific elevational criteria. In other words, an eco-zone is an upland zone if it is higher than the surrounding terrain. An upland zone may be situated at 3000 or 5000 feet as long as it meets this criterion.

Another shortcoming in Haberman's model was his failure to establish specific criteria by which site types are designated. Although he distinguishes sites by type (e.g., occupation site), they apparently were based upon intuition

and experience (Haberman 1973).

It seems reasonable to view the adoption of the bow and arrow as a technological advancement that would facilitate exploitation of a variety of eco-zones. However, Haberman failed to demonstrate why such exploitation should occur predominantly in lowland eco-zones. In fact, an intense increase in resource exploitation that crosscut all productive eco-zones might be expected. It is, therefore, unlikely that technological improvements of this type were major contributors to settlement pattern shifts in the Decker area as proposed by Haberman. In fact, it is doubtful that prehistoric technological advances of any type were solely responsible for culture change on the Northern Plains. Technological models alone, then, are insufficient for explaining change.

Haberman also felt that acquisition of the horse by prehistoric peoples in the Decker area contributed greatly to a Late Hunter Period shift from upland eco-zone utilization to the lowlands.

The increased mobility afforded by the horse and the demands of caring for the animals (e.g., water, graze) may have induced a new settlement pattern oriented towards valley floors of low terrace occupation sites. . . . (Haberman 1973:94).

While there is little doubt that along with the horse came special animal husbandry requirements, I doubt they were of sufficient magnitude to cause large-scale settlement and land utilization shifts. In fact, accepting the premise that the horse was not acquired by Northern Plains tribes until

circa A.D. 1700, the post-horse Late Hunter time span was less than two hundred years long. Ostensibly, Haberman's proposed settlement pattern shift began during the transition from Late Archaic to Late Hunter times, 1200 years before the horse on the Northern Plains. Thus, the time gap is too great to use the horse for Late Hunter settlement pattern shifts.

One step toward systematizing the Southeastern Montana archaeological record in space and time was taken by Beckes (1976) in his report of sites within the Custer National Forest near Ashland, Montana. Based upon vegetal, soil and topographic factors, Beckes (1976:6-8) recognized nine major ecosystems within the region. By statistically correlating eco-zones with site types, temporal affiliations and other scaled variables, Beckes was able to formulate tentative seasonal cyclical patterns for Archaic and Late Hunter Period populations. As did Haberman, Beckes (1976:79) found that during the Late Hunter Period a shift toward increased utilization of the lowland eco-zones began. This shift, Beckes (1976:79) reasoned, resulted from the "new need for larger volume sources of water and grasses" while maintaining horses.

Beckes utilized eight scaled variables (although the text, page 78, says nine, the appendixes indicate only eight) in formulating his statistical correlations. While the methodological reasoning used in correlations involving ordinal scaled variables of this type seems valid, theoretical

problems are present. The major problem lies in the formulation and scaling of the site type variable. Beckes neglected to establish a formal classificatory framework based upon function for the various site types utilized. Thus, the site types are intuitive and nebulous. Moreover, ordinal scaling (as used by Beckes) requires a relevant ordering of discrete categories into a meaningful sequence (Thomas 1976:22). Because Beckes offered no criterion(ia) for scaling his intuitive site types, it is difficult to discern the relevance of ordering functionally different sites within a single category and then utilizing that category as a scaled variable. Such practices render the final statistical correlations and processual assumptions tenuous.

It is apparent, then, that failure to devise a model that is sufficiently flexible to incorporate the entire pre-historic time span and delineate every utilized eco-zone can result in erroneous or incomplete conclusions. Furthermore, the model should be capable of accommodating a variety of archaeological sites and activities through the establishment of a formal classification of site types. Finally, the model should allow formulation of hypotheses regarding the nature of cultural processes through time. The following research model has been designed to facilitate accomplishment of the goals.

### Research Design

Brown (1965:4) noted that the formation of differing

eco-zones within a region is the product of a complex of interactions between all factors of the environment. Thus geologic development, soil associations, topography and, to a lesser extent, climatic influences are important factors that contributed to the formation and maintenance of eco-zonal biota in and near the project area.

While the climatic conditions in the Decker area are an integral part of the total floral complex that presently exists, it appears that micro-climatic differences are not of sufficient magnitude to be considered important in the proliferation of differing eco-zones (Brown 1965:6). Average annual climatic data throughout the lower Tongue River Valley (Brown 1965:28-31; Fox 1977:14) indicate uniform climatic conditions have existed throughout the Decker area. In regions having a uniform climate the chief differences in vegetation are probably due to local differences in topography and soils (Brown 1965:6).

Soil associations in the project area are strongly influenced by their parent materials, sandstone and shale sediments that were laid down by geologic processes during the Eocene and later epochs (Fox 1977:10). Extensive ecological research has demonstrated that soil influences are often a major factor in the distribution of vegetation (Brown 1965:8). Several soil associations exist in the project area and it is believed that these differences are major contributing factors in the maintenance of a variety of eco-zones.

The effects of degree of slope, slope exposure and position of slope (Brown 1965:82; Beckes 1976:6) are important topographic features responsible for the maintenance of eco-zones throughout the project area. Within this area the topography varies greatly from rugged, steep terrain of over two hundred feet in relief to gentle, rolling lands nearer the Tongue River. This physiographic variety exerts positive influences on the type and variety of eco-zones present. Degree of slope affects water retention, soil accumulation and heat energy incidence (Brown 1965:83). Exposure, or the direction that the slope faces, influences greatly the amount of solar insolation received (Brown 1965:88). And finally, Brown (1965:90) found that each plant community type occurred at a particular elevation on slopes under certain conditions. In the project area, this phenomenon is apparently a product of moisture availability (lower slopes usually receive more than upper slopes) rather than strict altitudinal influences.

As a result of the interrelationships of climate, soil development and various topographic slope factors, each eco-zone maintains a differing floral and faunal assemblage. Presumably, prehistoric man recognized the advantages of seasonally exploiting the vegetal and faunal resources of a variety of eco-zones. Also, depending on the eco-zone, shelter, water, open spaces and/or vantage points were readily available.

Binford (1964:426) defined the isolation and definition



of the content, structure and range of a cultural system within its ecological relationships as the "regional approach." The regional approach is a useful research design through which the prehistory of the Spring Creek Mine Project acreage and surrounding area may be examined. When articulating cultural systems with ecological relationships, at least four successive steps are necessary. They are:

- 1) isolate the regional environment into specific eco-zones.
- 2) identify and delimit the archaeological record in space and time.
- 3) examine the relationships between the archaeological record and specific eco-zones.
- 4) establish the nature of cultural change and/or continuity through time as it is reflected in the cultural ecological setting of the region.

The following eco-zones, primarily derived from Beckes (1976), have been recognized in the project area as integral systems in prehistoric human adaptations in the Decker area. These eco-zones are further grouped into two general categories, lowland and upland zones.

#### Lowland Eco-zones:

- 1) Creek Bottom This zone occurs exclusively along the ephemeral tributaries of the Tongue River. Deep alluvial

soils support heavy stands of short prairie grasses, some willows and an occasional cottonwood. Running water is usually available only during the spring runoff months but water is often available during dry months by digging in seep springs. In August of 1859, Captain Reynolds and his party, while exploring the Tongue River area, obtained water in this manner (USDI 1967:14). Beckes (1976:6) noted that this eco-zone is vitally important to wildlife and water quality. No sites in the project area were located in this eco-zone.

2) Creek Terrace Shallow silt loam soils support extensive stands of short prairie grasses and silver sage. Other common grasses include western wheatgrass and needlegrass (Beckes 1976:6). The silver sage provides a crucial winter forage for antelope. The sage and grass cover comprise the summer habitat of game fowl. Bison were formerly attracted to this zone.

Generally, slopes do not exceed 4 percent. In the upper, narrow creek valleys, habitable creek terrace areas seem to be restricted to the southern exposure. In the lower, expansive portions of the valleys, access to reliable water sources, some shelter from inclement weather and extensive forage grasses provide attractive natural resources. The Creek Terrace eco-zone is usually confined to the first or second terrace.

3) Lower Slope Fan/Terrace This eco-zone occurs

between the Creek Terrace and Scoria/Sandstone Outcrop zones. Lower slope fan areas are confined to alluvial fans, usually at the confluence of two creeks. Lower slope terraces are the large terraces between the creek bottoms and upland areas. These sloping terraces vary in steepness, but average from 4 to 8 percent. As a result, soil development is azonal and very shallow. Southern exposures support dense stands of big sage, also a winter forage item for antelope. Other faunal resources common to this zone are white-tailed deer and a variety of small fur-bearing animals. Bison probably frequented this zone in past millenia, grazing on extensive short prairie grasses.

#### Upland Eco-zones:

4) Scoria/Sandstone Outcrop - "The greatest variety of plant and animal species associated with any vegetative zone . . . is found in the breaks habitat on the shallow, weakly developed soils, shale exposures, sandstone outcrops and local accumulations of colluvial materials" (Becks 1976: 6). The broken terrain characteristics of this zone are valuable in the severe climate, for the draws, gullies and arroyos furnish shelter to the wildlife (USDI 1967:4). The variety of species is probably due to the heterogeneous characteristics of the environment caused by differences in soil texture, soil structure, slope and exposure, all of which contribute to the formation of a variety of microclimates (McConnell 1971).

Very often the Scoria/Sandstone Outcrop exists as an ecotone with the Dry Slope Ponderosa Pine eco-zone. As a result, dwarfed ponderosa pine and juniper are common to the zone. Other typical plants include skunkbrush (an important winter browse), short prairie grasses, berry bushes, and occasionally, sage. Water is often available in the form of springs and dendritic drainage heads. Because of the broken terrain characteristics, extensive snowdrifts accumulate on northern exposures during the winter. These drifts contribute to snow melt and provide reliable water sources well into the spring months.

5) Dry Slope Ponderosa Pine This system is of primary importance to mule deer and antelope as winter range (Beckes 1976:7). These animals find the juniper browse, ponderosa pine groves and broken terrain particularly desirable. Other vegetation includes skunkbrush, short prairie grasses and cactus. This zone is mostly confined to slopes greater than 8 percent. As a result, the system is well drained and reliable water sources are not often available. Soils are shaly and very shallow. The game animals that frequent this eco-zone usually prefer southern exposures.

6) Moist Slope Ponderosa Pine This eco-zone is located along and at the heads of small dendritic drainage systems and in sheltered arroyos and small canyons. The zone offers a source of water during the spring runoff months and shelter year around to a variety of game animals.

Soils are usually shallow and support a wide variety of vegetation, typical of which are ponderosa pine, juniper, Idaho fescue, yucca, cactus, chokecherry, snowberry, and sage. Effects of slope are of minor importance in this eco-zone. Beckes (1976:7) suggested that shelter was the primary concern in the utilization by prehistoric peoples of this zone. It seems likely that the wide variety of faunal resources were also quite attractive.

7) Upland Prairie Beckes (1976:7) divided the Upland Prairie eco-zone into two zones, sage and grass. The distinction may be valid, but for purposes here the upland prairie may be viewed as a single eco-zone.

This eco-zone is usually quite flat and expansive. It is by far the largest in areal extent of all the zones. Very shallow silty loam soils support a highly productive range grassland. Formerly, extensive bison herds found this range land quite attractive primarily during spring and autumn grazing. The zone's fringes with the Scoria/Sandstone Outcrop and Dry Slope Ponderosa Pine systems are favored habitats for deer and antelope. Readily available water supplies seem to be lacking year around.

Beckes (1976:7) noted that only peoples specifically oriented toward a large-scale hunting economy seemed to prefer the Upland Prairie eco-zone. This observation was derived from the recovery of numerous Plano tradition projectile points throughout the zone. Presumably, these big game hunters

found the large bison herds of the prairies and other game ungulates in the fringes quite attractive and restricted much of their resource exploitation to the uplands. This seems to be the case in the Decker area.

Once an eco-zone concept has been established, the next step is to identify and delimit the archaeological record by site type, site chronology and, whenever possible, site seasonality. Site types are established by evaluating the site's archaeological assemblage in reference to a formal site classification system. Site categories are based on a variety of criteria, including artifact types, lithic debitage assemblage, cultural features, faunal assemblages, density of cultural remains in conjunction with site size, and site function. A site classification system is presented in chapter 3. Specific time references are assigned to the site by two dating techniques, the use of artifact typologies and radiocarbon dates. Artifact typologies are relied upon heavily in this thesis. The site is then delimited spatially in terms of site boundaries and site location (e.g., located in the Scoria/Sandstone Outcrop eco-zone).

Following the establishment of an eco-zone scheme, identification of site types and placement of the site in time and space, relationships between the cultural (the archaeological record) and the natural (eco-zone) environment may be investigated. At the individual site level, these investigations should be designed to elucidate

functional relationships between the site and eco-zone selection, if any. Following similar procedures for each site in the inventory, a composite analysis of the total site inventory with reference to eco-zone preferences or regularities through time may be examined. The composite data may then be ordered so that formal statements regarding the project area may be made and regional applications of the research can be proposed.

Perhaps the most serious problem confronted by the eco-zone model is the inherent danger in assuming zonal stability throughout time. However, in the Decker area, it is possible that the eco-zones that exist today are similar to those that existed for the past seven or eight thousand years. Photographic comparative studies of the floral resources in the Tongue River area (including the project area) indicate a surprising stability in vegetal cover trends over the past one hundred years (USDI 1967:31-33; B-14-B-17). These trends suggest variations in vegetation intensity through time in a given eco-zone rather than major floral type changes or simple presence to absence (or vice versa) trends.

These suggestions are supported by recent periods of geologic and erosional stability. The topography of the Decker area has remained relatively unchanged in recent periods. The upland areas are remnants of an earlier erosion resistant upland plain (USDI 1967:6). In earlier geologic periods, valley cutting across the upland plain resulted in

the formation of a dendritic Tongue River drainage system. In recent periods, however, the gully cutting processes have remained relatively stable (USDI 1967:29). In fact, approximately 96 percent of the Decker area loses little soil to erosional processes (USDI 1967:3). Since eco-zonal characteristics in the Decker area appear to be primarily dependent upon geologic, topographic and soil factors, relative stability in these areas would indicate a concomitant stability in eco-zone maintenance. It is difficult to ascertain from present evidence exactly how long zonal stability may have persisted. Geologically, the term "recent" refers to post-Pleistocene time, hence the area may have been free of major geologic and erosional processes for as much as the last ten thousand years.

Presently there is little evidence from the immediate Decker area regarding environmental changes throughout the last ten thousand years. As noted earlier, a region's total floral and faunal assemblage is dependent to a large extent upon a favorable and stable climate. Yet, if different climatic conditions prevailed in the past, it is reasonable to postulate that the eco-zone assemblage might have differed from that of today. Evidence from preliminary palynological studies on selected soil samples from project test excavations revealed an absence of pollen from which paleoclimates might be deduced. These investigations are presently considered inconclusive.



Some scholars (Wedel 1961:255; Hurt 1953:216; 1966) have suggested that a drier, hotter period (than existed previously and subsequently) similar to Antev's Great Basin Altithermal persisted on the Northern Plains from ca. 4700 B.C. until ca. 2500 B.C. Derived from this concept came a persistent notion that the Northern Plains was reduced to near desert conditions unable to support big game animals. This condition either forced abandonment or a switch to a forager subsistence base. Reeves (1973:1221-1253) cites evidence to the contrary. He feels that prevailing precipitation patterns from ca. 6500 B.C. to ca. 2500 B.C. approximated those that exist today. These conditions are capable of supporting great expanses of short grass prairie and large bison herds. If Reeves is correct, one might also infer that eco-zones were much like those that exist today. Furthermore, earlier conditions (pre-6500 B.C.) were nearly identical (Reeves 1973:1227). It is reasonable to conclude that big game hunting persisted on the Northern Plains throughout the time span encompassed by the proposed Plains Altithermal.

It was only during a 1750-year time span after 2500 B.C. that minor fluctuations in the climate produced cyclical ecological stresses that reduced the big game dependence of prehistoric inhabitants on the Northern Plains. In contrast to earlier Altithermal concepts, however, big game hunting seems to have remained as the primary subsistence strategy.

It is suggested then, that the eco-zone assemblage

throughout the Decker area has remained relatively stable throughout at least the last 9500 years. Rather than totally different zones existing during various times in the past, it is probable that eco-zones similar to those of today experienced periods of varying intensity and coverage. This seems particularly true during the last Big Game Hunter, Early Archaic and latter portion of the Late Hunter prehistoric periods. The Late Archaic populations in the Decker area may have experienced cyclical instability in eco-zone maintenance and concomitant fluctuations in faunal and floral resources, but I believe that these systems, perhaps with the exception of during the transitional period between the Late Archaic and Late Hunter times, were not drastically altered.

#### Contributions of the Research

Archaeological investigations resulting from cultural resource management responsibilities can and should be designed to fulfill obligations from two perspectives, the practical and the professional. Practical contributions tend to benefit private industry and governmental regulatory agencies, although there are practical archaeological benefits also. Archaeologists have recently begun to view research of the type conducted in the proposed Spring Creek Mine Project area within a problem-oriented framework. This orientation (as opposed to mere salvage archaeology practiced earlier) has contributed significantly to solving processual problems in cultural change and/or continuity.

The archaeological research in the Spring Creek Mine area has the potential to make significant contributions to the professional community. Studies of this type, while restricted spatially, derive from the archaeological record, methods, formal classifications, theoretical models and hypotheses applicable to the entire region. From my analysis of the data from the project area I have been able to formulate a cultural ecological model using the ecozone concept, develop a formal site classification system and hypotheses regarding prehistoric land utilization of the Decker region through time. Such constructs are invaluable aids in planning, conducting and evaluating future archaeological investigations. Moreover, such research has the capability of testing existing regional hypotheses such as those formulated by Fredlund (1973), Haberman (1973) and Beckes (1976).

At the practical level, the Spring Creek Mine archaeological survey identified numerous sites that are not presently endangered by mining or ancillary operations. These sites may now be preserved for future problem-oriented research. Hopefully, at that point in the future, improvements in regional archaeological knowledge will increase the likelihood of proper data manipulation and analyses.

Archaeological surveys and research in the Spring Creek area have also benefited those State and Federal agencies charged with regulating nonrenewable cultural

resources. These agencies are responsible for evaluating and disposing of the archaeological resources of the area. Obviously, inventories of identified sites have facilitated the agencies. But to the agency the real value in research of this type lies in the description, documentation and recommendations provided in the final archaeological report. Using these data, the regulatory agencies are able to arrive at informed decisions regarding management of the archaeological resources. Practically speaking, these decisions will eventually insure preservation of our heritage and an appreciation of the past for the public trust.

From industry's viewpoint, perhaps the most obvious practical contribution of the Spring Creek Mine research is that it satisfies State and Federal laws and regulations. But there are other equally practical benefits. Because archaeological matters are now considered in the planning stages of industrial development, accurate site inventory has allowed industry to plan their developments accordingly, thereby avoiding costly mid-development alterations.

An often overlooked practical contribution of archaeological research in response to industrial development is in the area of public relations. When publicly displayed, archaeological data (e.g., projectile points, photographs, word pictures) recovered from the survey and popular, yet educational, reconstructions of prehistoric lifeways can enhance relations between the public and

industry. In short, archaeological displays are excellent vehicles through which industry can foster and maintain public confidence. By developing a public awareness and appreciation for an area's prehistory, archaeology also benefits.

## CHAPTER II

### AREA DESCRIBED

The Spring Creek Mine Project Area is situated approximately six miles (9.68 kilometers) north of Decker, Montana and extends along two small western tributaries of the Tongue River: Pearson Creek and Spring Creek (figure 4). An ancient upland surface that once extended over the entire region (Baker 1929:19) has been deeply trenched by these two drainage systems. Maximum surface relief is about eight hundred feet (243.84 meters), the highest point being in the extreme northwest corner of the area (approximately 4230 feet MSL or 1289.31 meters). The lowest elevation (3430 feet or 1045.47 meters) is near the Tongue River Reservoir. Generally, the more abrupt and rugged terrain of the higher elevations lie along the west and gradually slope into gently rolling hills eastward towards the Tongue River Valley.

Pearson and Spring Creeks head in the uplands to the west of the Tongue River and flow (during the spring months) in a southeasterly direction into the Tongue. In the western portion of the area, those ridges and drainage divides which separate Pearson Creek, the North Fork of Spring Creek and the South Fork of Spring Creek are characterized by sandstone,

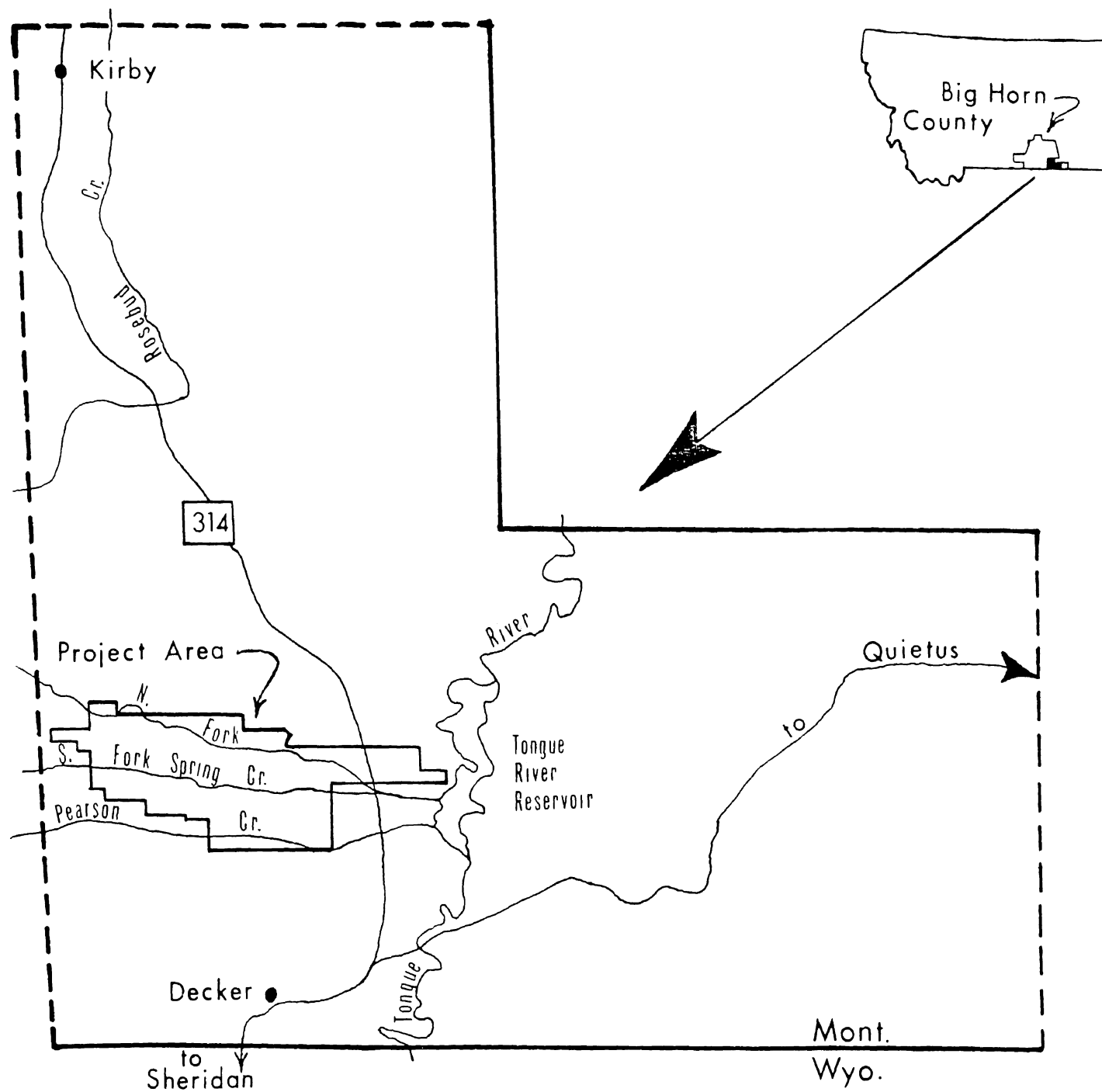


Figure 4. General Area Map

shale and clinker outcroppings and are quite precipitous. Often the surface relief between narrow stream valley floors and the ridges above exceeds two hundred feet (60.96 meters), particularly along the upper portions of the Pearson Creek forks. In comparison, the valley floors of the North and South Forks of Spring Creek are more expansive than those of Pearson Creek but the drainage divide ridges are every bit as precipitous.

Nearer the Tongue River and east of the confluence of the forks of Pearson and Spring Creeks, valley terraces become wider and the drainage divide ridges much less precipitous. The relief decreases considerably as the ridges slope gently into the valley floors below. In places, Pearson and Spring Creeks have cut into the underlying shale and sandstone strata to form small but impressive vertical red cliffs. Clinker rock outcroppings are characteristic of much of these mid-elevations.

Between Montana Highway 314 and the Tongue River Valley, the topography is flat to gently rolling. Here the project area narrows and follows the course of Spring Creek. Very little difference in elevation occurs along this course, generally only twenty to thirty feet (6.1 to 9.1 meters). There are occasional clinker outcroppings along the gentle slopes of Spring Creek terrace.

The project area lands are sparsely covered with short prairie grasses, cacti and sage. Occasional cotton-



woods, stands of willow, various bushes and tall grasses grow along the banks of Pearson and Spring Creeks. In the mid and higher elevations stands of Ponderosa pine (Pinus ponderosa) are common.

### Geology

The Spring Creek Mine Project Area is part of the northward extension of the Sheridan Coal Field (Baker 1929:16). These coal fields lie within the Great Plains physiographic province but, because of their proximity to another major province, the Rocky Mountains, they exhibit a surface relief greater than is common to the Great Plains (Baker 1929:19; USDI 1967:6). Within the area Pre-Cambrian granites are overlain by thick limestones, shales and sandstones upon which rest superficial deposits of stream gravel, sand and alluvium (Thom, Hall, Wegemann and Moulton 1935:80). Notable in this stratigraphic series are the Bighorn dolomite, the Madison limestone, the Chugwater formation, the Upper Cretaceous sandstones and shales, the Fort Union formation, and the overlying Wasatch shales and sandstones.

Following a series of marine depositions and land emergences during Cambrian times, the Bighorn dolomite, a type of limestone, was deposited in a vast sea when the region was submerged during the latter part of the Ordovician. Early in Carboniferous time the sea again entered eastern Montana and the Madison limestone was deposited. Again, following

alternating inundations and emergences during the Pennsylvanian Epoch, the characteristic Triassic red beds of the Chugwater formation were laid down. Throughout the Upper Cretaceous and later times, marine deposition accumulated, forming a stratigraphic sequence of sandstone and shales such as the Parkman sandstone of the latter part of the Upper Cretaceous and the Hell Creek sandstones of the early Tertiary. Both the Parkman and Hell Creek sandstones contain, among other fossils, fragments of turtle shells (Thom et al. 1935:59, 61).

By middle Eocene times the Big Horn and Pryor Mountain uplifts had been formed by orogenic activities that had occurred throughout the early Tertiary. Subsequent erosion of these uplifts and the Rocky Mountains to the west resulted in the fresh water deposition of the Fort Union formation. This formation is significant today because it contains abundant economic coal reserves. Interestingly enough, these Fort Union coal strata also indirectly played an important part in the prehistory of the area. Burning coal seams, ignited by prairie fires, lightning or spontaneous combustion (Rogers 1918:1), have baked the overlying shales and sandstones of the Wasatch formation into a variety of thermally metamorphosed rocks. From an archaeologist's point of view, the most important of these varieties is porcelanite, "a hard, dense, siliceous rock having the texture, dull luster, hardness,

fracture or general appearance of porcelain" (American Geological Institute 1973:557). Porcelanite provided the prehistoric inhabitants of the area with a suitable and abundant source of lithic material from which to fashion a variety of stone tools.

Throughout the professional literature, porcelanite is often referred to by several non-standardized terms including metamorphosed shale (Haberman 1973), siltstone (Loendorf, Barnett, Larson 1972: Appendix 1), altered shale (Bentzen 1962:118), porzellanit and porzellanjaspis (Zirker 1894:75-76), and porcelanite (Fredlund 1976:207). Fredlund (1976:207) also noted additional terms such as "metamorphosed siltstone," "baked shale," "Powder River chert," "grey chert," "fired brick," and "jasper" in reference to procelanite.

Procelanites suitable for toolmaking differ widely in appearance, ranging from hardened red shale and sandstone, through vesicular glassy slag, to gray-colored medium grained rocks (Rogers 1918:4). These differences are due chiefly to the amount of heat to which the original material was subjected, variances in heat retention, and mineral composition (Rogers 1918:4, 6; Fredlund 1976:208). By far the most abundant lithic material throughout the project area and surrounding terrain is of the gray procelanite variety. Not unexpectedly, the majority of artifacts and lithic debitage encountered during the survey was of gray procelanite.

To a lesser extent, red porcelanites and glassy slags were utilized by the prehistoric inhabitants of the area.

Gray porcelanite varies in color and vitreousness. Fredlund (1976:208) has noted ranges in his porcelanite samples of N6/ (medium light gray) to N4/ (medium dark gray) on the Munsell color chart. It is also found in banded varieties. Gray porcelanite occurs in vitreous and non-vitreous states, the latter being the most popular knapping variety. The knapping qualities of nonvitreous, gray porcelanite appear to be somewhat inferior to those of other lithic materials such as obsidian and chert, particularly during the core reduction process. However, in laboratory preliminary core reduction experiments it was found that non-vitreous, gray porcelanite cores can be reduced in a controlled manner, somewhat similar to the Levallois technique. Core reduction in the research area appears to have been somewhat unpatterned and opportunistic. This suggests that there was little need for controlled core reduction because of the abundance and readily available supply of gray porcelanite.

The survey crew did not encounter abundant natural deposits of red porcelanite during our survey. Small quantities, ranging in color from 5R4/2 (grayish red) to 5R3/4 (dusky red) (Fredlund 1976:208) on the Munsell chart, occur occasionally in the study area, usually in the form of artifacts and lithic debitage at specific sites. Although

Fredlund (1976:208) grouped red porcelanite with the gray variety under one category, I feel that it fits better into Rogers' (1918:6) "baked rock" category. Red porcelanite is characterized by Rogers (1918:6) as fracturing conchoidally and often resembling jasper. Figure 5 illustrates the relationship of porcelanite types to the burning coal seams.

Based on preliminary observations, it is tentatively suggested that typologically older projectile points, perhaps from the late Big Game Hunter through the Early Archaic Periods, when made of porcelanite, were usually of the red rather than the gray variety. A McKean variety projectile point (representative of the Early Archaic Period) found at 24BH1610 is made of red porcelanite. In 1974, a University of Montana archaeological survey party collected a red porcelanite Eden point (representative of the late Big Game Hunter Period) near Decker, Montana. Beckes (1976:25) and Haberman (1973:46) illustrated McKean variety specimens made of red porcelanite. The use of red and gray porcelanite may overlap during the Late Archaic Period. Loendorf, Barnett and Larson (1972:58), Beckes (1976:21) and Haberman (1973: 35, 60, 62) illustrated typical Late Archaic side-notched points of both colors. A side-notched specimen of gray porcelanite was collected from 24BH1595. Conversely, during the survey no Late Hunter Period side-notched specimens of red porcelanite were encountered. They were all of the gray variety. However, Haberman (1973:55) discovered at

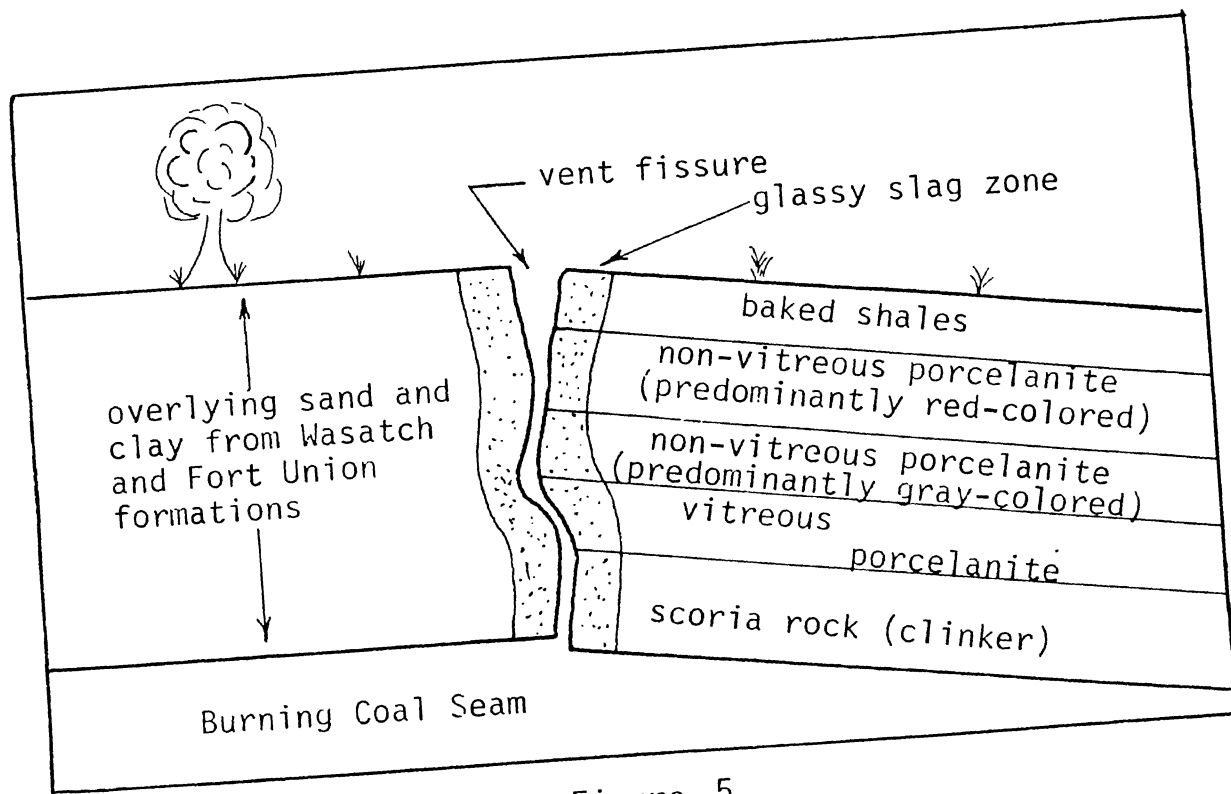


Figure 5

Relationships of porcelainite and other altered types to burning coal seams. Adapted from Fredlund (1976).

least one side-notched point made of red porcelanite. These tentative correlations must be considered as preliminary and in need of rigorous testing. Furthermore, the implications of these observations, if any, remain to be explored.

Frison (1974:61) called the glassy slags described by Rogers (1918:6) as non-volcanic natural glass. These two terms (non-volcanic natural glass and glassy slags) appear to be synonymous with Fredlund's (1976:208) "fused glass" category. Glassy slags occur along chimney vents of burning coal seams where temperatures reached their highest (see figure 5). These glasses often resemble obsidian but are usually quite vesicular and range in color from green, black and purple to banded varieties. They were not popular toolmaking materials in prehistoric times apparently because the vesicular nature of the stone reduced knapping control. Only one artifact made of glassy slag and only a few flakes of the material were discovered in the entire study area. There is, however, one possible source of glassy slag at site 24BH1597.

A variety of cherts, chalcedonies and quartzites also occur locally in the Quaternary terrace gravels and alluvium, although not in great amounts. These materials were often utilized by the prehistoric inhabitants of the area for making tools. Also, a few obsidian artifacts and flakes occur in the project area. Obsidian does not occur

locally in a natural state and was, no doubt, traded or brought into the area, probably from sources in Yellowstone Park.

The northward extension of the Sheridan coal field is an uplifted area now in the process of dissection (Baker 1929:32). Following the deposition of the Fort Union strata intermittent uplifts raised the rolling plain, and streams such as Pearson and Spring Creeks began to dissect it actively. Today, these streams are continuing to actively erode the area (Baker 1929:32).

### Climate

The climate in the Decker area is the continental steppe type of the Northern Great Plains area. It is semi arid and characterized by cold winters, warm summers, and a large variation in precipitation and temperature. Differences in relief, slope, soil exposure, plant cover and humidity help to create local microclimates throughout the area (USDI; Montana Department of State Lands nd:96).

Since 1949, the Decker area has received an average of 11.79 inches (30.2cm) of precipitation per annum (USDI; Montana Department of State Lands nd:98). Most falls during the late spring and early summer. Hot dry periods with high winds are normal throughout the summer. High winds during the winter months generally sweep the plains clear of snow, causing drifts in the draws and lowlands.



This climate, plus the effects of soils and terrain (USDI 1967:4) combine to form a short grass biome (Shelford 1963:330).

### Soils

Lithosols and Regosols are the major kinds of soils found in the project area (USDI 1967:9). The Lithosols developed over shale and sandstone bedrock while the Regosols have generally developed on loose unconsolidated sediments. Both have poorly developed horizons (azonal) (Southard 1969: 25) and are shallow (10"-20") (25.6-51.3cm) to very shallow (below 10") (25.6cm) (USDI 1967:9). These soils are strongly influenced by their parent materials, sandstone and shales, and they occur on gentle to steep slopes with sparse plant cover (USDI 1967:8, 9). Shallow zonal soils called brown soils, occur occasionally on the uplands. Deeper soils occur in the valleys of Pearson and Spring Creeks (USDI 1967: figure 12).

Specifically a Thedalund series-Midway series soil association dominates the mid and higher elevations in the western portion of the project area. This association consists of well drained, moderately fine calcareous clayey soils. Near the confluence of the forks of Spring Creek and easterly to the Tongue River, the Wibaux series-Thedalund series-Spearman series association is predominant (USDI, USDA 1972:11). This association is generally calcareous and

loamy. These soil associations vary in depth but are generally classified as shallow or very shallow. In many places, particularly along the ridges and upland flats, soil erodes away nearly as rapidly as it is formed by the weathering of the parent shales and sandstones (USDI 1967: 9).

Tests on selected soil samples from those archaeological sites that were test excavated generally indicated a transition from a noncalcareous surface to a calcareous subsurface. Ph tests ranged from 8.0 to 8.5 on all of the samples tested.

At site 24BH1610 there was a unique situation involving the soil cover. The site is located on a 3 to 4 percent slope along Spring Creek on shallow, undeveloped, lightly compacted loamy soils. Hundreds of small "ground heaves" occur throughout the approximately ten acre site. These ground heaves vary in size from one to three feet (30.5-91.5cm) in diameter. In the middle the heave bulges upward from 1"-3" (2.54-7.7cm) higher than the surrounding ground but tapers into the surrounding soil at the edges. Grasses and other vegetation do not grow on the "heaves," but are plentiful on the surrounding ground. The surfaces of the heaves are a light pink in color while the surrounding earth is medium reddish brown. From preliminary observations it did not appear that they resulted from rodent activities, human activities or frost heaving.

These observations suggest that ground heaves are a result of yet unknown processes that brought subsurface deposits to the surface. Small, friable porcelanite fragments coated with calcium occurred on the surface of ground heaves. These fragments were identical in appearance to those that were found below the surface during test excavations at the site. Conversely, the porcelanite fragments lying upon the surface surrounding the ground heaves did not have a calcareous coating. In addition, soil tests indicated that surface of ground heaves were calcareous. Subsurface deposits at 24BH1610 were also calcareous, while the surface soils surrounding ground heaves were noncalcareous.

There is further evidence in the archaeological record of this apparent soil mixing. The surface of some ground heaves at 24BH1610 contained flecks of charcoal and small bone fragments. Subsequent test excavations into this ground heave and the immediate surrounding area revealed the presence of subsurface cultural deposits which included stone artifacts, butchered bison bone and charcoal. These deposits occurred in each of eight arbitrary levels from the surface down through twenty-four inches (61.5cm).

The archaeological significance of ground heaves, if, in fact, local soil dynamics do cause subsurface mixing, are at least twofold. First, they may be regarded,

as is the case at 24BH1610, as potential indicators of subsurface deposits and secondly, they might disturb any stratigraphic relationships present. The ground heaves at 24BH1610 may or may not be a local phenomenon. If they occur elsewhere in the region, their archaeological implications assume a broader significance. Observations regarding ground heaves are extremely tentative, and subsequent additional research is necessary to establish firm conclusions.

### Flora

Short grass grasslands are predominant in the project area. According to a Tongue River area land classification study (USDI 1967:23), perennials make up approximately 80 percent of the vegetation cover, followed by sagebrush (8 percent), conifers (5 percent), juniper (3 percent), and annuals (3 percent). A variety of other types comprise the remaining 1 percent.

The most common perennials are bluestem (western) wheatgrass (Agropyron smithii) and blue gramma (Bouteloua gracilis) followed by needle-and-thread (Stipa comata) and bluebunch wheatgrass (Agropyron spicatum). In response to the semiarid climate, these and other grasses and forbs develop deep and extensive root systems (see Shelford 1963: 331) which serve to hinder erosive processes. The dense roots also render subsurface archaeological investigations

exceedingly laborious.

A variety of sage occurs throughout the project area, the most common of which is big sagebrush (Artemisia tridentata). The 1967 USDI study (page 24) lists a number of other Artemesia that occur, including A. cana, A. frigida, A. campestris, and A. ludoviciana. Apparently silver sage (A. cana) grows more frequently on the lowlands in deeper soils nearer the creeks while other varieties, such as big sage, occur on the terraces and uplands in shallower soils (personal communication, Craig Howard, 1976).

Ponderosa pine (P. ponderosa) is common in the project area but is generally restricted to the scoria/sandstone ridge where soils are shallow. It is usually dwarfed (USDI 1967:10). Junipers (Juniperus spp.) are commonly found in association with ponderosa pine.

Other common plants are broom snakeweed (Gutierrezia sarothrae) and skunkbush (Rhus trilobata). Among the more frequent annuals are bromes (Bromus spp.) and fescues (Festuca spp.). Cottonwood (Populus sargentii) and willows (Salix spp.) are found infrequently in the creek bottoms and near springs. Yucca (Yucca sp.) and prickly pear cactus (Opuntia spp.) seem to occur throughout the area regardless of elevation and/or soil types. For a comprehensive frequency list of plant species, see the USDI's publication, Tongue River Area: Classification of Public Domain (1967: 25-26). Also, Haberman's (1973) site descriptions often

detail plant varieties quite well.

### Fauna

In an ecological sense, the terrain, the climate, the soils, and the biota of the Spring Creek Mine Project and surrounding area are continuously interacting and mutually dependent. Throughout the area, stands of juniper serve as a significant browse to wildlife, especially deer (USDI 1967:10). Similarly, silver sage and big sage vegetative types supply a crucial habitat, one of winter forage, for the pronghorn antelope (USDI, USDA 1972:32, 35). The broken terrain characteristic of the area is valuable in the severe climate, for the draws, gullies and arroyos furnish shelter to the wildlife (USDI 1967:4).

Shelford (1963:344) characterized this ecological relationship as the blue gramma-pronghorn association of the short-grass biome. Members of several genera, including Bouteloua, are the principal grasses of the association, while bison (Bison bison) and the pronghorn antelope (Antilocapra americana) are the major influents. B. bison no longer exists in the short-grass biome of southeast Montana. Lesser influents include the cottontail rabbit (Sylvilagus sp.), the coyote (Canis latrans), a variety of foxes, the badger (Taxidea taxus), skunks, weasels and ground squirrels. A variety of larks, including the western meadowlark (Sturnella neglecta), hawks and sparrows are also

influent as are reptiles such as the western rattlesnake (Crotalus atrox) and bullsnake (Pituophis catenifer). Other lesser influents include several species of grasshoppers and other orthopterans.

During our survey we encountered a variety of fauna, including some mentioned as influents in the blue gramma-pronghorn association. Perhaps the most frequently encountered species was the pronghorn antelope. Coyote packs, some with eight or ten individuals, were common. Mule deer (Odocoileus hemionus) frequented the upland draws and breaks. Reptiles included the prairie rattlesnake (Crotalus viridis viridis), horned lizards (Phrynosoma sp.), garter snakes (Thamnophis sp.) and a sagebrush swift lizard (Sceloporus graciosus). We also observed several golden eagles (Aquila chrysaetos), meadowlarks and a variety of hawks and grouse. In addition, we saw a fox (Vulpes vulpes or V. macrotis) and a porcupine (Erethizon dorsatum).

At least one rare and endangered species, the prairie falcon (Falco mexicanus), has been identified in an area designated by the United States Department of Agriculture and the Interior as the Decker-Birney Resource Area (USDI, USDA 1972:34). The Spring Creek Mine Project Area is included within this resource area. Other species that are known to inhabit the resource area are white-tailed deer (Odocoileus virginianus), grouse (Pediocetes phasianellus sp., Centrocercus urophasianus), pheasant (Phasianus

colchicus), Hungarian partridge (Perdrix perdix) and wild turkey (Meleagris sp.). Fur-bearing mammals identified in the Decker-Birney Resource area include muskrat (Ondatra zibethicus), beaver (Castor canadensis), bobcat (Lynx sp.), mink (Mustela vison), and raccoon (Procyon lotor). Some of the species identified in the Decker-Birney report, such as beaver and mink, cannot and do not, because of specialized habitat requirements, inhabit project area lands.



## CHAPTER III

### CULTURAL CHRONOLOGY

A broad cultural chronology based upon artifact typologies and absolute dating techniques is emerging for southeastern Montana and adjacent northern plains areas. This chronology, based upon data from sites throughout the high plains country of Montana, Wyoming, the Dakotas, and several Canadian provinces, seems to coincide fairly well with Mulloy's (1958) cultural sequence as he outlined it for the Northwestern Plains. His outline includes the Early Prehistoric Period and the Late Prehistoric Period (A.D. 500-A.D. 1800). Mulloy's Early Prehistoric Period is often called the Big Game Hunter Period. The Middle Prehistoric Period, also known as the Archaic (Jennings 1974:152), is divided into Early and Late Periods. This discussion follows recent usage of the tripartite chronological scheme, labeling the major cultural periods as: the Big Game Hunter Period, the Archaic, and the Late Hunter Period.

The earliest cultural manifestation of the Big Game Hunter Period is the Llano Complex, recognized by a large distinctive, partially fluted blade known as the Clovis

point. Llano populations were apparently small, mobile bands of mammoth hunters present in the Plains around 12,000 years ago. The subsequent Folsom culture overlapped Llano in time but endures until ca. 8000 years ago. The Folsom Complex derives its name from characteristic small, fully fluted Folsom points. Folsom hunters probably lived in small, nomadic bands that relied mainly on extinct species of bison. The last cultural manifestation of the Early Prehistoric Period was the Plano Complex--hunters who preyed upon both extinct and modern forms of bison 7000 to 10000 years ago. The Plano Complex is marked by two main groups--the Plainview and Parallel-flaked projectile point types (Willey 1966:44). The Plainview group includes Plainview, Midland, Milnesand, and Meserve point forms, while the Parallel-flake group contains Agate Basin, Scottsbluff, Eden, and Frederick types. The Frederick projectile point type is also known as Angostura (Willey 1966:44); Scottsbluff and Eden points were formerly known as the Yuma or Cody Complex (Wormington 1957:103ff, 266).

Although data representing the Clovis and Folsom Complexes of the Big Game Hunter Period are presently not known from the project area and surrounding plains, there are such sites in Montana and Wyoming. A probable Clovis burial site near Wilsall, Montana was excavated by Taylor (1969). However, it was not possible to associate definitely the skeletal material with the Clovis artifacts. The recent

discovery of the Colby Site, a mammoth kill site near Worland, Wyoming, resulted in the recovery of two Clovis-like points. A radiocarbon date of  $9250 \pm 200$  B.C. ( $11200 \pm 200$  B.P.) has been obtained from the Colby Site (Frison, Wilson and Wilson 1974:117-118).

An extensive Folsom campsite, the Hanson Site near Shell, Wyoming produced a radiocarbon date of  $8750 \pm 670$  B.C. ( $10700 \pm 670$  B.P.) (Frison, Wilson and Wilson 1974:118). The MacHaffie Site (Forbis 1955) near Helena, Montana is another important Folsom Complex site. Scottsbluff points were discovered above the Folsom level at the MacHaffie Site. The Sister's Hill Site, the earliest known site on the eastern flank of the Big Horn Mountains yielded two radiocarbon dates of  $7700 \pm 250$  B.C. ( $9650 \pm 230$  B.P.). The site is located southwest of Buffalo, Wyoming (Frison, Wilson and Wilson 1974:116). It is also known that Pryor Stemmed and Lovell Constricted type projectile points from the Big Horn and Pryor Mountain Ranges span a period of time from 7050 B.C. (9000 B.P.) to 4550 B.C. (6500 B.P.) (Frison, Wilson and Wilson 1974:119).

At the Hell Gap Site in Wyoming some 250 miles (155.35 kilometers) southeast of Decker, Montana, the oldest cultural levels contained Agate Basin type projectile points, and date from circa 8000 B.C. to 7000 B.C. Following Agate Basin, and later in time, were Hell Gap points; these were succeeded by Alberta points. The Alberta levels gave way to

Scottsbluff and Eden levels which had a mean date of 6640 B.C. (8590 B.P.). The uppermost Big Game Hunter tradition featured a tool complex known as the Frederick (Willey 1966:47). The lower Frederick level at Hell Gap yielded a radiocarbon date of 6670 B.C. (8620 B.P.) (Irwin et al. 1966).

The earliest known evidence indicating use during the Big Game Hunter Period of the Decker, Montana area is from the Plano Complex. Fredlund (personal communication 1976) found what he designates as a Hell Gap point on a high rock bench near Squirrel Creek. His discovery was an isolated find in Section 13 of Township 9 South, Range 39 East. Excavations at another site on Squirrel Creek in the summer of 1976 yielded a point from the lower levels that Fredlund (personal communication) considered to be representative of the Frederick tradition. Also, earlier Fredlund (1972:17) had discovered an Eden point upon the surface approximately one mile (1.7 kilometers) north of Decker, Montana.

The early Archaic Period is well represented in and around the project area. Perhaps a major artifact assemblage during this period were those in the McKean Complex (see Wheeler 1954:7 14; Mulloy 1954b:432-460) as they were defined at the McKean Site. This site is situated about 130 miles (209.68 kilometers) southeast of the project area in northeastern Wyoming. There, several distinct varieties of projectile points were classified as McKean, including

"classic" McKean, Duncan and Hanna. On the northern plains, this complex usually dates between 5000 and 3000 years ago.

Level II at the Kobold Site (24BH406), located just 12 miles (19.35 kilometers) north of the project area contained projectile points that fit within the range of variation noted by Mulloy (1954b) at the McKean Site. This level has been dated at approximately 2750 B.C. (4700 B.P.) (Frison 1970:28). Another Early Archaic site in Powder River County, Montana, 24PR5, contained material dated by radiocarbon at  $2500 \pm 125$  B.C. ( $4450 \pm 125$  B.P.). Haberman (1973), Beckes (1976), Loendorf et al. (1972), and Fredlund and Fredlund (1973) all reported finding McKean variant projectile points. In addition to other McKean variants, a Duncan point was recovered from 24BH1610. On the base of numbers of sites, there is little doubt that by the beginning of the Late Archaic the Decker area was regularly utilized if not permanently occupied.

The Late Archaic is characterized by the appearance of a variety of corner-notched projectile points. Level III of the Kobold Site yielded corner-notched points with slightly convex to slightly concave bases (Frison, Wilson and Wilson 1974:116). Obsidian hydration dates of 582 B.C. (2532 B.P.) and A.D. 316 (1634 B.P.) were assigned to this level. Other Late Archaic Period sites near the Kobold Site include 48SH311 with radiocarbon dates of  $650 \pm 200$  B.C. ( $2600 \pm 200$  B.P.) and  $510 \pm 140$  B.C. ( $2460 \pm 140$  B.P.) and 48SH312, dated at

960 $\pm$ 140 B.C. (2910 $\pm$ 140 B.P.).

The Late Hunter Period is marked by the appearance of side-notched projectile points on the Northwestern Plains. Many scholars feel that this change in projectile point types reflects the transition from the atlatl and dart to the bow and arrow (Kehoe and Kehoe 1968:28). All of the surveys in the Decker area have produced side- and unnotched projectile points characteristic of the Late Hunter Period. At the Kobold Site, side-notched points with straight or indented bases lay within Level IV. Artifacts within this level were dated by the obsidian hydration technique at A.D. 933 (917 B.P.). Materials at the Foss Site associated with side-notched points had a radiocarbon date of A.D. 1470 $\pm$ 100 (480 $\pm$ 100 B.P.) (Frison, Wilson and Wilson 1974:116).

In summary, the Decker area has been utilized by prehistoric populations for the last six to seven thousand years. The earliest peoples no doubt exploited the area only occasionally, but by around five thousand years ago some seasonal occupation was occurring. Frison (1970:9) discovered evidence of a very early (3000-3500 B.C.) occupation of the earliest level (Level I) at the Kobold Site. These earlier populations were nomadic, perhaps living in small family groups and hunting big game, particularly extinct and modern forms of bison.

Judging from the archaeological remains the Early Archaic populations began utilizing the area in a seasonal fashion, if not permanently occupying it. The bison jump became a popular method of procuring meat and hides. Earlier hunting techniques had depended upon individual skills or cooperative activities such as bison trapping to facilitate the kill. Level II at the Kobold Site is the earliest evidence of bison jumping in the area. As Haberman (1973:8) noted, this evidence of bison jumping increases by some 2000 years the antiquity of the use of the jump technique for bison procurement on the Northwestern Plains. However, bison trapping was never abandoned altogether as is evidenced by a nearby Archaic bison trap site (24PR5).

Bison jumping and bison trapping required cooperative expeditions that could have occurred only through planning and foresight. Perhaps in the Early Archaic, the nomadic groups became somewhat larger, often joining together for economic purposes. If so, social organization may have become more complex.

Bison jumping continued at the Kobold Site throughout the Late Archaic and Late Hunter Periods, although bison butchering techniques apparently underwent some change. By now the area was probably occupied on a more or less permanent basis by nomadic hunters who moved in a

predetermined manner to exploit seasonally the varying resources. Social groups had apparently become quite large and complex.



## CHAPTER IV

### SITE TYPES

#### Occupation Sites

The term occupation site as used herein denotes sites where surface evidence indicated that the area was occupied or utilized with some degree of permanency and/or for some specific purpose. It is difficult to assign arbitrary parameters to these two criteria but it is suggested that permanency requirements might include wintering sites or year around village sites (e.g., Upper Missouri River earth lodge sites). In contrast, Native American occupation on the Northern Plains is thought to have been one of the transhumance with a pattern of spring and autumn movements into areas with abundant game and edible plant resources. The duration of stay at these sites was variable but at times did not exceed several days. However, movement to and occupation of these sites was designed for specific purposes such as butchering activities, overnight or extended duration campsites, hide preparing, hunting expeditions and the like.

The surface evidence used as criteria for defining occupation sites within the Decker area also varies. Ideally, the surface of an occupation site might contain

chipped stone flakes, bone and/or tooth fragments from game animals, perhaps charcoal and a variety of artifacts. These artifacts might include butchering tools such as knives, choppers and bifaces, perhaps pottery, hide preparation tools (e.g., awls, perforators, scrapers), bone tools, bone and stone ornaments, and projectile points. However, sites closely approximating the "ideal" were rarely encountered in the Decker area, so more practical criteria had to be established.

Generally, the presence of lithic debitage including a variety of artifacts such as scrapers, knives, awls, choppers and/or projectile points was sufficient evidence of an occupation site. The types of tools present in the tool assemblage indicated utilization of the site for specific purposes. In addition, ample lithic debitage indicated the toolmaking and sharpening activities that accompanied specific tasks such as hide preparation or butchering processes.

In the Decker area, small plano-convex end scrapers were invariably made of agate, chert or chalcedony, but most of the crude butchering and chopper tools were fashioned from white and purple quartzite. Therefore, the presence of a variety of lithic materials (e.g., chert, quartzite, chalcedony) in the debitage of a site might indicate an occupation site. In addition, the presence of only one tool type in sufficient numbers (such as numerous hide

scrapers) at a site may also indicate a specific activity, hence an occupation site. Often cultural features, such as the presence of fire hearths alone, are sufficient evidence of an occupation site, however this situation was not evident at any of the sites encountered during the survey. Of course, the occurrence of any combination of "ideal" criteria is usually sufficient evidence of an occupation site.

Many archaeological sites that were used for specific purposes might be excluded from the category of occupation site. Vision quest sites and quarry sites were utilized for specific purposes but they often do not meet any of the aforementioned surface criteria. These sites are assigned categories of their own.

There are other sites that are obviously occupation sites but, because of their unique qualities, are often subsumed under different categories. Tipi ring and buffalo jump sites are excellent examples of these phenomena.

In summary, occupation site parameters are arbitrarily defined but should reflect the conditions that exist at any one locality (e.g., earth lodge villages on the Upper Missouri or seasonal sites on the Northern Plains). On the Northern Plains, occupation sites are the result of specific, often seasonal activities and variety in the lithic debitage and artifact assemblage usually reflects these activities. Other non-artifactual evidence such as fire hearths and faunal remains are excellent supplemental evidence.

### Lithic Scatter Areas

Lithic scatter areas are so designated because of the lithic debitage scattered about the surface of the site. Lithic debitage is a term used to denote rock that has been modified by man in culturally determined ways. This modified stone can occur as artifacts, flakes and/or cores of varied sizes. Unmodified rock chunks may be classified as debitage when they meet certain requirements: 1) when the stone is of a variety utilized in lithic manufacturing, and 2) when found in association with modified stone, or 3) when the rock is of a variety that is not indigenous to the area in which it is found and has not been moved into the area by natural forces. The assumption in the latter requirement is that if the stone is not indigenous, it must have been culturally transported from its source.

Other than surface debitage, lithic scatter areas usually contain little or no evidence of occupation or specific activities. They contained no evidence of faunal remains, and other cultural features are usually absent. Lithic scatter areas need not contain artifacts, although when artifacts do occur, they are generally few in number and are very often non-diagnostic. The size of a scatter area varies, but in the project area such lithic areas were usually no larger than several hundred feet square.

Lithic debitage densities also vary throughout the

project area. Generally, a few flakes (less than ten) found scattered over several hundred feet square was not considered to be an archaeological site. Conversely, the same amounts of flakes or more when found concentrated within small areas (e.g., 24BH1585, 24BH1586, 24BH1587, 24BH1588, or 24BH1592) were labeled as "chipping stations." When lithic scatter areas were found in association with other archaeological phenomena the entire assemblage was assigned a different classification such as occupation site, tipi ring site, etc., and the lithic scatter was noted in the description.

### Chipping Stations

Chipping stations in the Decker area resemble lithic scatter areas inasmuch as they are composed primarily of flakes and spalls and occasionally contained an artifact or two. Many artifacts are non-diagnostic although projectile points sometimes occurred. Perhaps the most distinguishing features of a chipping station are its areal extent and the density of detritus. Such sites rarely exceeded ten to fifteen feet square. Often as few as a dozen flakes are concentrated in this small area. However, at other sites (e.g., 24BH1592) an abundance of lithic debitage occurred in piles in an area as small as one square foot.

Chipping stations in the study area appear to have been the result of a brief, individual stone knapping

activity. Usually the flakes on such sites are large percussion flakes with few small pressure spalls indicating that the toolmaker paused only momentarily to fashion a crude blank. Apparently the finished artifact was fashioned elsewhere. Very often chipping stations are found near lithic scatter areas or occupation sites, implying a possible relationship between the two.

### Rockshelters

Numerous sandstone rock overhangs occur naturally along the higher ridges and bluffs in the Decker area. Those that exhibit evidence of prehistoric utilization are termed rockshelters. During a recent archaeological survey of the Decker/Birney area, Loendorf et al. (1972:64) noticed that many rock overhangs did not exhibit any evidence of prehistoric activities. Usually those overhangs were inconveniently small. But many of the large overhangs did function as prehistoric shelters, some apparently over a long period of time.

Fredlund (1973:27) observed that often the ground surfaces inside many rockshelters were covered with a dense, compacted layer of cattle dung. The dung layers obscured any surface cultural indications that might have been present. This condition existed in the study area of 24BH1584. However, a nearby densely scattered lithic area (24BH1583) offered important clues which suggested that the rockshelter

at 24BH1584 was periodically occupied.

At Horseshoe Cave (24RB1073), a prehistoric rock-shelter located less than thirty miles (48.4km) northeast of the project area, McLean (1976:87) found subsurface evidence which tentatively suggested that occupation may have occurred as early as circa 5000 B.C. Radiocarbon dates, the earliest of which is  $150 \pm 80$  B.C. ( $2100 \pm 80$  B.P.), appear to be more reliable.

From charcoal in the lowest level of Colt 45 Rock-shelter (24RB1012), Fredlund (1973:36) obtained radiocarbon dates of A.D.  $20 \pm 120$  ( $1930 \pm 120$  B.P.) and A.D.  $45 \pm 100$  ( $1905 \pm 100$  B.P.). Level II was dated at A.D.  $710 \pm 100$  ( $1240 \pm 100$  B.P.) and Level IV dated from less than two hundred years ago. No suitable dating materials were encountered in Level III. This rockshelter is located approximately ten miles (16.1 km) south of Colstrip, Montana.

Most rockshelters are situated near seasonal sources of water. Some springs and small creeks are active only during the runoff months, a fact that suggests that if water was a selection factor, rockshelters were generally occupied during spring and early summer months.

The literature search revealed an occupied rock-shelter that was reported measured  $4\frac{1}{2}$  feet high, 7 feet deep and 16 feet across (1.4 x 2.1 x 4.9 meters) (Loendorf et al. 1972:65). This was the smallest shelter encountered. Other rockshelters were considerably larger (Fredlund 1973:

27-29), measuring 15 feet deep and 51 feet across (4.6 x 15.5 meters). The shelter at 24BH1584 measured nearly 7 feet high, 10 feet deep and about 27 feet across (2.1 x 3.1 x 8.2 meters).

In summary, sandstone overhangs that contain evidence of prehistoric occupation are called rockshelters. They vary in size and shape. Rockshelters may have been utilized as early as seven thousand years ago, although a cluster of radiocarbon dates suggests that, at least in the Decker area, they have been used for the past twenty-five hundred years. Often the surface cultural evidence at rockshelters is obscured by cattle dung.

#### Vision Quest Sites

Through vision it was possible to rise from abject poverty to affluence and social prestige. Even war parties were, at least in theory, wholly dependent upon them. . . . Since success in life was conceived of as a result of these revelations, probably all men tried to secure a vision, though many of them failed. Conversely, lack of success was attributed to lack of visions (Lowie 1922:323).

Although Lowie was writing on the role of visions in the life of the Crow Indians, Benedict (1922:1) has noted that all Plains tribes as well as peoples in areas to the east and west, sought a spiritual helper. Moreover, each tribe had its own distinctive version of the vision experience (Benedict 1922:3) which was thought to insure success or change a person's status. Visions, then, played a very important role in the life of the mature Plains Indian (Benedict 1922:3).

Benedict (1923:26-27) described two means of obtaining



a spiritual helper among North American Indians: 1) through visions actually sought by the individual, usually involving self-mortification, and 2) by unsolicited visions which simply appeared. In his study of Crow Indian religion, Lowie (1922: 325-343) recognized three means by which an individual could obtain visions: 1) painless experiences wherein the vision came without self-torture and under non-stress conditions (e.g., a dream); 2) stress visions, including those not deliberately sought but which appeared during times of stress; and 3) sought visions wherein the individual deliberately quested for vision powers. Actually, Lowie's painless and unsought stress visions can be subsumed under the unsolicited vision category proposed by Benedict.

Benedict and Lowie were concerned with the ritual and ceremony associated with vision seeking phenomena. They paid little attention to the archaeological manifestations of sought-after visions--the vision quest site. In 1961, Wedel (1961: 266) postulated that elliptical, oblong and horseshoe-shaped rock structures in the Pryor Mountains were fasting shelters used in the vision quest. In 1967, Connor recorded direct ethnographic evidence that confirmed Wedel's suggestions. Since then nearly one hundred of these structures have been recorded throughout the Northwestern Plains (Good 1975:77).

Vision quest structures vary in size and shape. They are usually constructed by piling rocks to a height of one to two feet (Loendorf 1974:91) and are elliptical, oblong or

horseshoe in shape (Wedel 1961:266). In some cases wood was utilized in the construction of these structures (Loendorf 1974:91, Wedel 1961:266). The remains encountered by Wedel (1961:266) in the Pryor Mountains were roughly four to five feet wide, five to eight feet long and eighteen to twenty inches high. Both Wedel (1961:266) and Loendorf (1974:91) noted that horseshoe-shaped structures invariably open to the east, the direction of the rising sun.

With the exception of three vision quest sites recorded by Good (1975:78) all of the recorded sites which we encountered during our research were located at high elevations. However, Good noted that sites located at lower elevations were always situated on high, prominent points of land. Wedel (1961:266) recognized that the nearly inaccessible locations of the Pryor Mountain structures provided the necessary solitude required by vision seekers. Areas within the Pryor Mountains reach elevations of 8600 feet above sea level. Wedel also reported vision quest structures on McCullough Peak (elevation 5945) east of Cody, Wyoming and on Heart Mountain (elevation 8195), both located within the Big Horn Basin.

In summary, visions played a very important role in the life of the adult in Plains Indian society. There were at least two types of visions: those which were sought-after, and unsolicited visions. Vision quest archaeological sites contain the scanty remains left by vision seekers. In and near the Big Horn Basin these remains are always located on isolated,

prominent landscape features, usually at high elevations. The structures at vision quest sites vary in shape from oblong or elliptical to horseshoe-shaped and sometimes included a wooden superstructure. They also vary in size but are usually large enough to allow a person to lie prone or sit upright. The isolated locations provided solitude for fasting and prayer; vision quest structures provided some protection during the long ordeal.

### Petroglyph Sites

Although there have been numerous interpretations of prehistoric rock art on the Northern Plains, the purposes and meanings of these phenomena remain tantalizingly enigmatic even today.

Rock art may be divided into two categories: pictographs and petroglyphs. The latter category consists of lines, figures, or other representations that were pecked or incised into the rock, while pictographs are paintings upon rock surfaces. Earlier classifications (Steward 1937:405; Mulloy 1958:118) included both painted and carved figures within the category "petroglyph" and reserved the term pictograph to refer to a type of primitive writing that might be placed not only on stone, but on other materials as well. Steward's and Mulloy's approach may be valid but it seems rather awkward for these purposes. Therefore, pictographs and petroglyphs are distinct categories as defined above. It should also be noted that petroglyphs and pictographs often occur on the flat surfaces

of immovable, nearly vertical rock cliffs and outcrops.

Keyser and Knight (1976:10) noted that petroglyphs do not occur in western Montana, rather pictographs are quite common. Interestingly enough, in general the opposite seems to be true in southcentral and southeastern Montana (Fredlund 1973:17). Petroglyphs are the most frequently occurring type of rock art perhaps because the many soft sandstone surfaces are ideal for pecking and incising (Fredlund 1973:17). The presence or absence of suitable stone panels may not be the only significant factor in trying to explain this apparent dichotomy. Keyser and Knight (1976:10) indicated that softer rocks are also abundant in western Montana, yet no petroglyphs are found there. Unlike the situation that exists in western Montana, pictographs do occur in eastern Montana, often with petroglyphs as at Pictograph Cave near Billings.

Mulloy (1958:119) concluded that rock art could only be interpreted by the original artist and his community, therefore the graphic significance would always remain obscure. Despite such pessimism, there have been numerous attempts to derive cultural origins and functions from petroglyphs and pictographs (e.g., Keyser and Knight 1976).

Accurate techniques for dating rock art have not been developed, but there are several time indicators that do suggest origins (Fredlund 1973:17). Representations of guns and horses imply that the pictographs or petroglyphs were of recent origin whereas rock art showing the bow and arrow could

date from as early as the beginning of the Late Hunter Period. As mentioned in an earlier section, the bow and arrow probably replaced the atlatl and dart sometime in the Late Hunter Period (circa A.D. 800-A. D. 900). The horse was introduced onto the Northern Plains circa A.D. 1700, and firearms followed a bit later. Thus the pictographs and petroglyphs themselves often do provide data for relative dating.

Other more tenuous interpretations regarding the evolution of rock art have been suggested. Connor and Connor (1971: 12) perceived a general trend toward more skillful draftsmanship with the passage of time, particularly in southern Montana. However, they did note that such interpretations are often rendered untenable in nomadic groups such as those that existed on the Montana High Plains. Long ago, Boas (1940:564-592) demonstrated that evolutionary sequences in art styles may be unreliable indicators of relative time.

Gebhard and Cohn (1950), in their analysis of the rock art at Dinwoody, Wyoming in the Wind River Valley, concluded that several distinct styles were present at the site and that these styles were probably produced over a great period of time. Six styles and their relative chronology were established. Subsequently, Gebhard (1969:15-22) revised this sequence to include Style 1 (Early Hunting Style), Style 2 (Interior Line Style) and Style 3 (The Plains or Late Hunting Style). Each rock art style had its own technique of representation, and Gebhard attempted to date rock art on the basis of style

rather than technique and skill as did Connor and Connor.

Often stratigraphic cultural deposits may lie at the base of rock art panels. Mulloy (1958:119) suggested that cultural levels could be equated with certain petroglyphs but such correlations cannot be regarded with certainty. Some relative dating techniques Mulloy suggested are rock art superimposition, the use of diagnostic figures (e.g., horse, gun) and the exclusion of lower stratigraphic levels from which the rock art panels were inaccessible.

Cultural affiliations of rock art motifs are equally as hard to establish. A popular motif in southeastern Montana is the one frequently interpreted as a shield-bearing warrior. Connor and Connor (1971:17) suggested that shield-bearing warrior motifs are nothing more than autobiographical; that each was drawn by an individual warrior. Other scholars have suggested that the motif is culturally characteristic of prehistoric Athabascans (Aikens 1967:204), that it has Shoshonean origins (Malouf 1968:1-19) or that it diffused from the Southern Plains through Utah to the Northern Plains (Gebhard 1969:729-731). There are other zoomorphic and anthropomorphic motifs in southeastern Montana but the origin and meaning of each is as elusive as for the shield-bearing warrior motif.

No doubt prehistoric rock art had a variety of functions. Many of the pictograph sites that Keyser and Knight (1976:11) examined in western Montana related to the vision quest, a widespread religious practice on the Northern Plains.

Connor and Connor (1971:29) felt that some, but not all, rock art on Montana's High Plains reflects a hunter's attempt to ensure hunting success by means of magic. According to Mulloy (1958:118), "pictographs" were primitive attempts to represent objects or events. Historic examples wherein mobile art represented important events are known to exist. One such example is a representation by the Sioux Chief Red Horse of the 1876 battle at the Little Big Horn (Graham 1953:58-59, 61). Interpretations of geometric rock art are even more speculative.

Certainly one of the major reasons why interpretations regarding cultural origins and functions of pictographs and petroglyphs range from speculative to untenable is because of the difficulty in correlating subsurface cultural deposits with particular rock art panels. Mulloy (1958:119) was able to derive some relationships at Pictograph Cave albeit rather nonspecific ones, from stratigraphic correlations. More detailed excavations at rock art sites on the Northern Plains may eventually provide the data that will allow more specific conclusions regarding pictographs and petroglyphs.

### Quarry Sites

The term quarry site is used to denote an area from which suitable toolmaking materials are obtained. In the Decker area such sites are invariably porcelanite quarries. The largest, most productive porcelanite quarries are most often located at higher elevations along the ridges and bluffs

which separate the small tributaries of the Tongue River. At some quarry sites porcelanite occurs in outcrops (Haberman 1973:42); at others porcelanite chunks occur scattered naturally about the tops and slopes of ridges and hills (e.g., 24BH1589, this report).

As Haberman (1973:42) and Loendorf et al. (1972:67, 69) commented, many porcelanite quarry sites contain heavy concentrations of large percussion flakes. These observations, plus a lack of small pressure retouch flakes and completed artifacts, suggest that blanks and preforms were fashioned at the quarry site. The finished artifacts were then chipped from the blanks elsewhere.

Haberman (1973:42, 47) reported at least two quarries where dark red porcelanite may have been obtained, however, gray porcelanite is by far the most abundant throughout the Decker area. Haberman (1973:46) suggested that the color clues of porcelanite outcrops may have aided prehistoric occupants in their search for lithic materials.

Carbone (1972:18) reported finding two quarries that were not in the immediate area of porcelanite outcroppings. They were "actually holes or mines dug downward to obtain material." These were discovered in Carbone's Acme-Decker area.

According to Fredlund (1976:210), porcelanite was readily available on the surface and at outcrops along the ridges year around. Even during the winter months the quarry



areas were blown or melted free of snow. Another advantage of porcelanites noticed by Fredlund, is that unlike other knapping materials, prolonged exposure does not seem to reduce its workability.

Although porcelanite is by far the most abundant lithic material, other suitable knapping materials such as chert, agate, quartzite, and chalcedony were also utilized. Most often these materials were obtained from river gravels of the Tongue River and its perennial tributaries. Obsidian, which does not occur locally, was brought into the area.

### Medicine Wheels

Stone circles that have internal rock lines like spokes in a wheel are called medicine wheels (Malouf 1961:388). Basically, medicine wheels are very often located on high, prominent areas that afford good to spectacular views of the surrounding lowlands. However, at least one such wheel, the Fort Smith Medicine Wheel south of old Fort C. F. Smith, Montana, does not conform to this standard. It is located on a small, sloping bluff that overlooks the Big Horn River. Like the Sun River Medicine Wheel near Lowry, Montana, the Fort Smith Wheel does not have an outer circle of stones enclosing the hub and spokes.

Perhaps the most famous medicine wheel is located at an elevation of 8700 feet (2651.8m) in the northern Big Horn Mountains. It lies on ground overlooking the Big Horn Basin

to the west and provides a spectacular view of the Rocky Mountains. This wheel, the Big Horn Medicine Wheel, has a twelve foot (3.7 meters) diameter hub, twenty-eight spokes and an outer stone circle that measures eighty feet (24.4 meters) in diameter.

Not all medicine wheels are as large or as inaccessible as the Big Horn Wheel. One medicine wheel located three miles east of Sheridan, Wyoming appears to be between ten and fifteen feet in diameter (3.1-4.6 meters). The wheel is situated on a ridge overlooking Sheridan and the Big Horn Mountains to the west. The hub is a rock cairn with rock spokes enclosed by a larger stone circle (USDI 1967; figure 18).

The problems surrounding the purpose and origin of medicine wheels have given rise to much speculation (Wedel 1961: 266-267). As Wedel (1961:268-270) reported, "the Crows knew about the wheel (the Big Horn Medicine Wheel) but could say nothing about its builders except that it was made by people who had no iron." Others have attributed medicine wheels to the Arapahoes, Cheyenne and Shoshone. These interpretations assume a relatively recent origin of medicine wheels, since historically known tribes are late comers who arrived during the closing phases of the Late Hunter Period. Mulloy (1952: 137; 1958:212-213) felt that the Big Horn Medicine Wheel has a greater antiquity and thus a yet undetermined origin.

Most authors agree that medicine wheels must have figured prominently in ceremonial functions. The nature of

these ceremonial functions is speculative, however. Wedel (1961:270) reported that historic Blackfeet erected simpler medicine wheels to mark the residence or grave of an outstanding war chief. Others have noticed the similarity between medicine wheels and sun dance lodge floor plans. Some have suggested that medicine wheels were related to celestial observations.

### Tipi Ring Sites

An archaeological phenomenon often encountered on the Northern Plains is the stone ring, a series of stones arranged in a circular fashion. Commonly called "tipi rings," they occur in a variety of sizes and locations. The most common explanation regarding the origin and function of stone rings is that they were domestic in nature, namely, the stones were used to secure tipi hides to the ground. This practice protected the occupants from the wind, rodents and reptiles. When the conical tipis were removed, the stones remained and approximated the lodge's floor shape. Tipi rings were not encountered during the project area but they are a common occurrence in the Decker area. Therefore, they are described as a site type.

Stone rings occur from New Mexico to as far north as the prairie provinces of Canada. Ring sizes vary from two to eighty feet in diameter (Malouf 1961:385) and occur in single, double or multiple course varieties (Malouf 1961: figure 1). Stone rings are found in a variety of locations, from wind-

swept ridges to protected river terraces.

Most scholars hesitate to attribute a domestic origin to all stone rings, particularly to those at the extreme ends of the range of variation. Further, not all scholars agree in their interpretations.

William Mulloy (1954a:54-5) argued that the preponderance of data suggest that stone circles did not serve a domestic function. Very often the stone rings contained more rocks than are necessary to secure a tipi hide. Moreover, stone ring sites were encountered in improbable campsite locations, most often at the end of unvegetated, wind-swept ridges without protection and away from firewood and water. Without exception, the stone rings Mulloy investigated lacked any evidence of fire. He also noted a paucity of artifacts and cultural debris at stone ring sites. Based upon his investigations in Wyoming's Shoshone Basin, Mulloy concluded that the function of stone rings was at best, problematical. He did, however, concede that during historic times stones were used to anchor tipi hides to the ground, but argued that evidence did not favor such usage in prehistoric times.

Mulloy's concessions regarding the domestic nature of stone rings in historic times is precisely the basis by which Thomas Kehoe (1958:861ff) arrived at his hypotheses concerning the origin and function of stone rings. Using the direct ethnological approach, Kehoe presented convincing evidence in support of the domestic function hypothesis. He marshalled a

variety of historical and ethnological data to prove his point. Kehoe concluded that the term "tipi rings" should be restricted to those stone rings that measure between approximately seven to thirty feet in diameter, but averaging about sixteen feet in diameter (1958:871). Other manifestations, also built of rocks, were not tipi rings and should not be subsumed under this heading (1958:872). Kehoe further suggested that smaller tipi rings predate the introduction of the horse on the Northern Plains. With the horse present, greater burdens could be transported and this fact allowed a concomitant increase in tipi sizes. Hence, the larger the tipi ring, according to Kehoe, the more likely it was constructed after the advent of the horse.

Malouf (1961:381ff), tracing the history of ideas on the subject and using ethnographic and historic data to support archaeological conclusions, arrived at essentially the same conclusions as did Kehoe. Malouf noted that most sites do, in fact, show stone rings to be usually located in favorable locations (1961:383) and even those in apparent unfavorable conditions have some advantages (1961:385). He concluded that those stone rings that range in size from twelve to thirty-five feet in diameter are domestic in origin and are "tipi rings." Other stone rings, however, served different functions; Malouf (1961:388) designated extremely large or small rings as Ceremonial Rings. Other types are subsumed under the categories Circular Walls and Medicine Wheels.

Loendorf (1969:73) discussed an interesting natural cause that might form stone rings. The presence of a permafrost layer (during the Ice Age on the Northern Plains) and freeze-thaw alternations at the surface may produce ground patterns in the form of stone circles. However, Loendorf noted that these circles are usually incomplete and poorly formed.

In summary, stone rings on the Northern Plains undoubtedly served a variety of functions. Those known as "tipi rings" were domestic in origin and are found in differing sizes and at various locations. Other stone rings were undoubtedly used for ceremonial purposes. Some may even be a result of natural causes. Finally, variation in the sizes of domicillary rings may indicate a pre- or post-horse adaptation and thereby provide relative chronological ages for tipi rings.

## CHAPTER V

### SITE DESCRIPTIONS

#### 24BH1583 Many Snakes Site

##### Site Description

The Many Snakes Site is a lithic scatter area located atop a south-facing sandstone outcrop at an elevation of 3980 feet (1213.1m). The view from the outcropping is very impressive, especially of the Big Horn Mountains towards the south. The sandstone rim of the outcropping provides an excellent vantage point for surveillance of the upper forks of Pearson Creek. Close, higher ridges to the southwest through north to the east restrict the view to several hundred yards in these directions.

The site is located in a Scoria/Sandstone Outcrop ecozone among numerous juniper bushes, sage, occasional yucca and cacti, and short prairie grasses. A stand of tall and reed grasses 200 feet (60.96m) east of the site, suggested that a small seasonal spring may have provided a source of potable water. This spring was not active when we recorded the site in July, but apparently it had been flowing earlier in the spring. The only other water source is Pearson Creek. It,

too, flows only during the spring and is very difficult to reach from 24BH1583 because of the precipitous slope.

The spatial extent of 24BH1583 was estimated at 35 yards by 15 yards (32.0 x 13.6m). There was a heavy scattering of lithic debitage throughout the area. Estimated cultural depth at the site varies but, due to the underlying sandstone base, probably does not exceed 6 to 8 inches (15.4-20.5cm).

### Lithic Debitage

A large amount of porcelanite flakes lay scattered over the area. Our sample included seventy-seven light to dark gray porcelanite flakes, seven red porcelanite flakes, and one rather small (less than 1 gram), multi-colored chert flake. The porcelanite flakes were mostly of the percussion flake variety and range in size from 6cm long by 4cm wide by 1cm thick to 1cm by 1cm by .2cm. Some of the smaller flakes apparently resulted from pressure flaking activities.

We collected seven artifacts, only one of which may be considered temporally diagnostic: a plano-convex end scraper (figure 6a), a broken side scraper (figure 6b), a worked flake (figure 6c), a broken biface (figure 6d), a complete biface (figure 6f), and an obsidian side-notched projectile point (figure 6e). All except the projectile point are made of gray porcelanite. The projectile point is a characteristic artifact type of the Late Hunter Period.



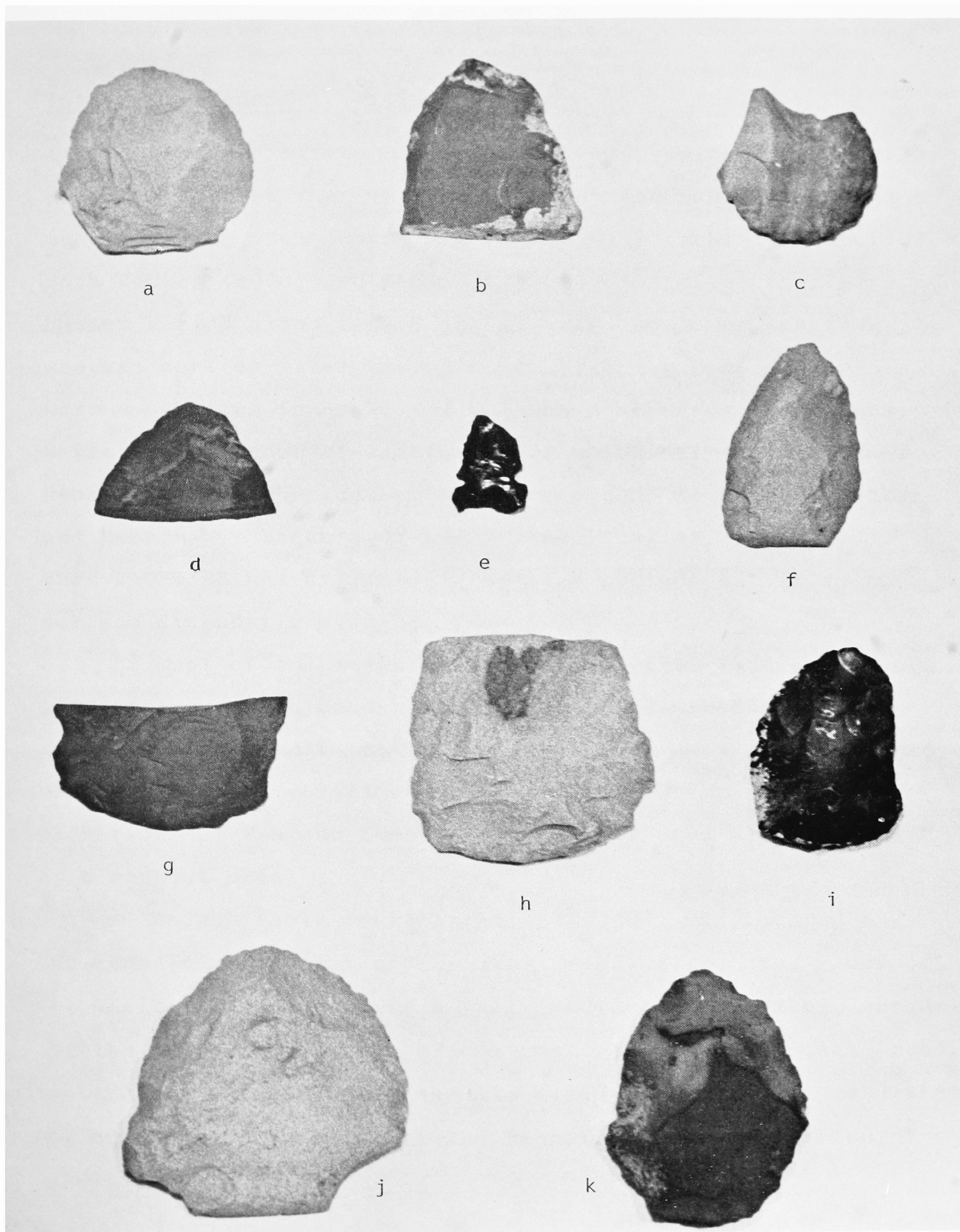


Figure 6. Artifacts: a-f, 24BH1583; h, 24BH1586; i-k, 24BH1589. Actual size.

## Interpretations

Because of the presence of a side-notched projectile point we believe that the Many Snakes Site was utilized as a manufacturing area during the Late Hunter prehistoric period. Both Beckes (1976) and Haberman (1973) suggested that Late Hunter Period sites tended to occur in the lower eco-zones, whereas earlier sites (Archaic and Late Big Game Hunter) were most often found in the uplands near creek headwaters. While the evidence at 24BH1583 does not flatly reject these hypotheses, neither does the evidence tend to confirm Beckes and Haberman. Because of its upland location, it is possible that 24BH1583 was utilized in earlier periods but if so no surface diagnostic evidence remained.

Most of the lithic evidence indicates that only rough preforms were fashioned here, although the presence of scrapers might imply that hide-working had occurred. Because of its excellent position for surveillance over the lower elevations of Pearson Creek, 24BH1583 may have also been used as a lookout area.

An habitable rockshelter (24BH1584) was located only 200 feet (60.96m) east of the Many Snakes Site. The floor of the shelter was covered by a thick, hard layer of dung, obscuring the presence, if any, of cultural data. If, in fact, the rockshelter was utilized, the two sites (24BH1583 and 24BH1584) may be related functionally and temporally. A discussion of 24BH1584 follows.

24BH1584 Imagination OverhangSite Description

Imagination Overhang (figure 7) is situated approximately 200 feet (60.96m) west of and slightly lower than (elevation 3970 feet or 1210.1m) the Many Snakes lithic scatter area. This south-facing rockshelter overlooks a small seasonal tributary of Pearson Creek. The view from the rockshelter to the south is excellent. The upper Pearson Creek drainage system, the precipitous ridges beyond and the Big Horn Mountains in the distance are readily visible. The view is severely restricted in all other quadrants.

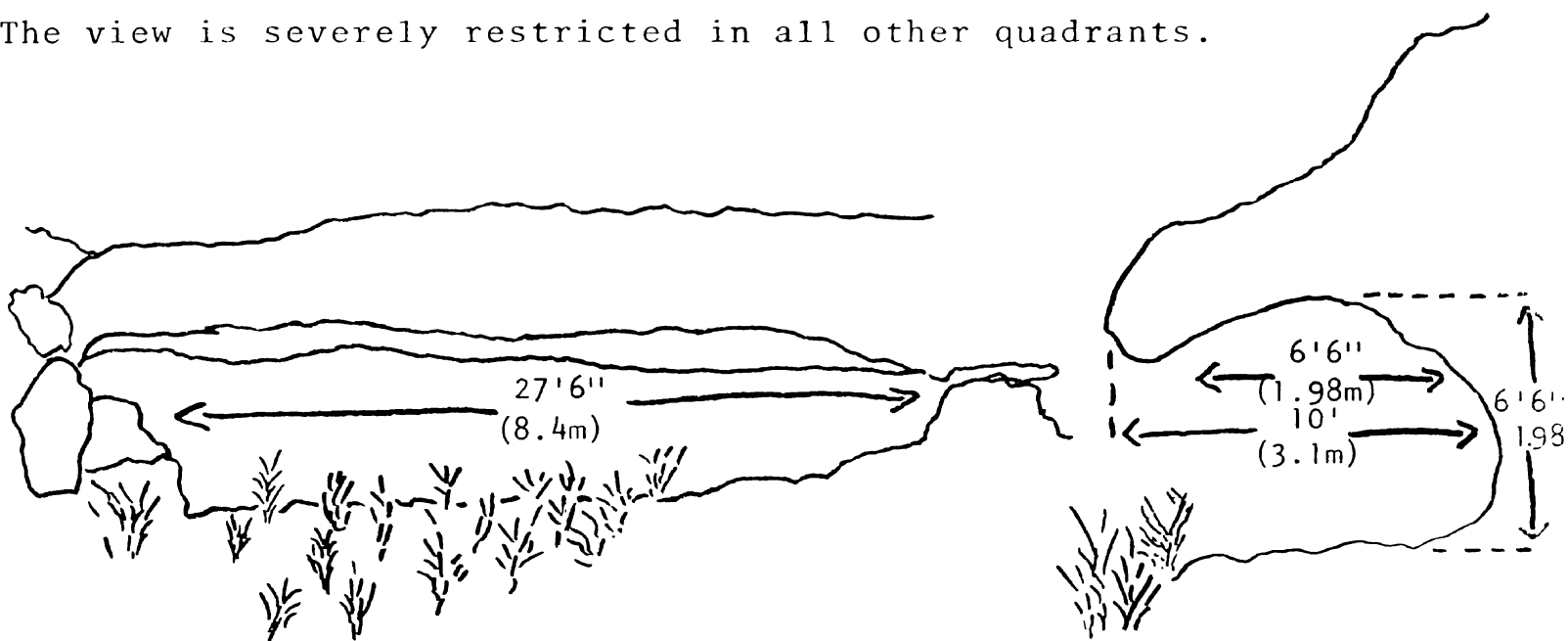


Figure 7. Rockshelter (24BH1584)

What appears to be a small seasonal spring heads near the opening of the rockshelter. This spring, the same one discussed in conjunction with 24BH1583, probably was active only during the spring months. Tall reed grasses rim the

structure's opening. Occasional sage and yucca are also present. The terrain slopes sharply downward immediately outside and away from the rockshelter. This steep gradient was apparently caused by erosion from the spring waters. The site lies in the Scoria/Sandstone eco-zone.

We did not observe any cultural evidence on the floor of the rockshelter or immediately outside the overhang. This apparent lack of cultural debris, however, may be misleading. Several inches of hard, compacted dung cover the rockshelter's floor and tall, thick grasses obscure the surface around the rockshelter. Fredlund (1973:27ff) encountered a similar situation at Colt 45 rockshelter (24RB1012) near Colstrip, Montana, yet subsequent excavations revealed nearly 2000 years of periodic occupation. Therefore it is very likely that 24BH1584 contains extensive subsurface cultural deposits.

In addition, we feel that the lack of surface lithics at Imagination Overhang may be due to the closeness of the Many Snakes lithic scatter area (24BH1583). Hundreds of flakes, small cores and stone artifacts occurred at 24BH1583 indicating the possibility that the people who lived in the rockshelter made some of their tools at 24BH1583.

The fact that prehistoric peoples used other rockshelters throughout the Decker-Birney area lends further credence to the suggestion that 24BH1584 may have been, despite the absence of surface evidence, utilized periodically. McLean's (1976:87) excavations at Horseshoe Cave (24RB1073)

revealed several cultural levels, the earliest of which may be associated with the Late Big Game Hunters. Loendorf et al. (1972:65) also discovered cultural evidence at a rock-shelter (24BH1014) only a few miles from the study area.

### Lithic Debitage

None

### Interpretations

It is difficult to interpret 24BH1584's position and relationships in time and space without any typological evidence. However, based on an hypothetical inter-site relationship with 24BH1583, this site may have been utilized at least during the Late Hunter Period. Judging from the evidence present in rockshelters within the area, Imagination Overhang was probably occupied during earlier cultural periods also. Because of the obvious shelter advantages, it is possible that Imagination Overhang may contain around 2000 years of subsurface cultural deposits.

### 24BH1585 Pearson Creek Chipping Station #1

### Site Description

This chipping station site is located on a small terrace overlooking Pearson Creek to the north. The view provides good surveillance up (west) and down (east) Pearson Creek but is restricted to the north and south by higher ridges. The

site lies in the Moist Slope Ponderosa Pine eco-zone at an elevation of 3740 feet (1139.9m). Vegetation includes ponderosa pine, juniper, sage, cacti, and short prairie grasses. This chipping station closely resembles three other nearby chipping stations, 24BH1586, 24BH1587, and 24BH1588. The nearest water source is Pearson Creek, a seasonal drainage 100 feet (30.5m) north.

### Lithic Debitage

Throughout a site area of about 20 feet by 20 feet (6.1 x 6.1m) we found only ten gray porcelanite flakes. These ranged in size from 5.5cm by 3cm by 2cm to several flakes the size of a twenty-five cent piece. One large flake exhibits irregular scars along one edge. This flake may have been used as a small hammerstone during the knapping process. Two other flakes retain part of the original core surface. We did not discover any artifacts at this site.

### Interpretations

Without diagnostic materials it is not possible to assign temporal relationships to this site. The evidence does suggest, however, that the site was probably used only once by an individual who did some knapping there. Because of the paucity of surface debris we do not feel that there are any subsurface deposits at 24BH1585.

24BH1586 Pearson Creek Chipping Station #2Site Description

This site is located on a southern terrace of Pearson Creek less than one-quarter mile west of 24BH1585 in a Moist Slope Ponderosa Pine eco-zone. This chipping station resembles others in the immediate area (24BH1585, 24BH1587, 24BH1588). Located at an elevation of 3740 feet (1139.9m), the site is dotted with ponderosa pine, sage, cacti and short prairie grasses. The view is identical to the view at 24BH1585. Water is available during spring runoff months at Pearson Creek.

Lithic Debitage

We collected three red and fourteen light to dark gray colored porcelanite flakes from an approximate 20 square foot area ( $6.1\text{m}^2$ ). These seventeen flakes represented all that were present on the surface of the site. In addition, we found a broken biface of gray porcelanite (figure 6h) and a broken antler tine (12.3cm long, 1.6cm in diameter). The surface of the tine is rough and has numerous longitudinal cracks indicating lengthy exposure, yet it is still relatively well preserved. The tine appears to be worn smooth around the fractured end. The wear pattern and location of the break at the smooth area suggest the tine was used as a pressure flaking tool.

Flakes ranged in size from 5.8 by 4.0 by 1.1cm to no

larger than a five-cent piece. Three of the largest flakes were of the vitreous porcelanite type.

### Interpretations

Without adequate diagnostic artifacts it is not possible to relate the site accurately with any particular cultural period. The well preserved antler tine tool suggests a recent date, perhaps late in the Late Hunter Period.

Apparently, the site was used only for a single chipping episode. All surface lithic materials were removed to the laboratory. The paucity of surface materials strongly suggests that there are no subsurface cultural deposits.

### 24BH1587 Pearson Creek Chipping Station #3

### Site Description

This chipping station site is situated in an upland Prairie eco-zone on a cuesta north of Pearson Creek. The view in all quadrants is excellent, providing observation for several miles. This station lies directly north of and less than one-quarter mile (402.3m) from 24BH1586 at an elevation of 3780 feet (1152.5m). Water is available in the spring months from nearby Pearson Creek. Vegetation includes sage, cacti and short prairie grasses.

### Lithic Debitage

We collected only eight medium-gray-colored porcelanite



flakes from inside an area ten feet square ( $3.1\text{m}^2$ ). These ranged in size from about the size of a silver dollar to no larger than a dime. No artifacts were observed. All of the flakes were the same color and appear to be from the same core. There were so few surface flakes, we do not feel that there are any subsurface cultural deposits at 24BH1587.

### Interpretations

This site was apparently used for tool manufacturing only once by a single individual. The lack of diagnostic artifacts makes temporal associations difficult.

### 24BH1588 Pearson Creek Chipping Station #4

#### Site Description

24BH1588 is located on a small hill overlooking Pearson Creek, less than one-quarter mile east of Chipping Station #3. The ephemeral creek would have been the nearest potable water source. One can see for several miles in all directions, but the site area is unprotected from inclement weather. The site is at an elevation of 3780 feet ( $1152.1\text{m}$ ) in the Upland Prairie eco-zone. Vegetation includes sage, cacti and short prairie grasses.

#### Lithic Debitage

The total site area does not exceed fifteen feet square ( $4.6\text{m}^2$ ). We found a gray porcelanite core ( $7.5 \times 7.0 \times 2.8\text{cm}$  in size), five gray porcelanite flakes, one glassy

slag flake and a tooth fragment (probably from an incisor of an unidentified mammal) within the small area. We also collected two light gray porcelanite flakes which have been worked along one edge (not illustrated) and a broken biface of dark gray colored porcelanite (figure 6g). All of the surface materials observed on the surface were removed to the laboratory. Based on the small amount of surface evidence it seemed unlikely that there were any subsurface cultural deposits present.

### Interpretations

Again, it is difficult to place the site in time because there were no diagnostic artifacts. As was the case at other nearby chipping stations, the cultural evidence at 24BH1588 seems to have resulted from a single instance of stone knapping. We were not able to assess the significance of the tooth fragment. The three artifacts suggest that, unlike other chipping stations on Pearson Creek, attempts were made to finish an artifact at the site.

### 24BH1589 Flying Ant Quarry Site

#### Site Description

This quarry source for gray porcelanite was located atop a drainage divide ridge that separates Pearson Creek from the South Fork of Spring Creek. The ridge was oriented in a southeast-northwest direction and consisted of five

prominent knolls of varying sizes. Elevations varied from 4040 to 4100 feet (1231.4-1247.7m) allowing an excellent view for several miles in all quadrants. The narrow ridge was well defined by precipitous slopes on either side.

Water (from the spring runoff) was available from either Pearson or Spring Creek but access would have been difficult because of the steep slopes. Relief between the ridge top and the creek bottoms exceeds 250 feet (76.2m) in this area. The ridge slopes are in the interface of the Scoria/Sandstone-Dry Slope Ponderosa Pine eco-zone while the ridge top falls in the Upland Prairie eco-zone. Vegetation along the slopes includes occasional ponderosa pine, juniper, sage, prairie grasses, cacti and yucca. Ponderosa pine and juniper are absent along the ridge tops.

Unworked light and dark gray porcelanite nodules lay scattered about the surface of each of the five knolls. Porcelanite outcrops were not present at this site. There were also hundreds of flakes and cores mixed randomly with the porcelanite nodules. The cores varied in size from a silver dollar to as large as a man's fist. We observed one large nodule of unworked porcelanite (approximately 35.9 x 15.4 x 20.5cm), but most were about half that size. All of the flakes may be classified as percussion spalls. This fact, coupled with an apparent lack of smaller, pressure flakes, indicates that only initial toolmaking stages (core and flake preparation) were carried out at the site.

Apparently most of the finished tools were manufactured elsewhere.

A rock alignment roughly rectangular in shape was located atop the largest and highest knoll at an elevation of 4100 feet (1249.7m). The rocks enclosed an area large enough inside for a man to sit upright. Some of the rocks comprising the structure occurred naturally, while others appear to have been added. Dimensions of the structure were estimated at seven feet long, three feet wide and two feet high (2.1 x .9 x .6m).

We discovered two gray porcelanite bifaces (figures 6j and 6k), a red porcelanite biface (figure 6i) and numerous percussion flakes in the vicinity of the rock alignment at 24BH1589. No wood, timbers or branches were found in association with the structure.

The surface data do not allow us to formulate definite conclusions regarding the origin and function of the rock alignment at 24BH1589. There are, however, some possible functions including a vision questing area or an eagle catching pit. The following evidence favors the suggestion that the structure functioned as an eagle catching pit.

The Decker area is a natural habitat for golden eagles. Historically, Plains Indians revered eagles and utilized their tail feathers (Fredlund and Fredlund 1973: 49). It is not surprising then, that eagle catching pits

should be a part of the archaeological assemblage in the Decker area.

There are several reports of structures identified as eagle catching pits in the Decker area. Fredlund and Fredlund (1973:37) described and illustrated what is apparently an eagle catching pit associated with a bison jump site (24BH1729) just a few miles south of the project area. That structure's dimensions (seven feet long, four feet wide and 2.7 feet high) (2.1 x 1.2 x .8m) closely approximate those of the structure at the Flying Ant Quarry Site. Both were located on high ridges separating small creeks.

The Fredlunds (1973:16-17) discovered another rock structure which they identified as an eagle catching pit in Section 35 of Township 9 South, Range 38 East. That site (24BH1079) was located on the edge of a butte and measured five feet long, three feet wide and two feet high (1.5 x .9 x .6m).

Another eagle catching pit (24PR401) was discovered less than a mile east of the Powers-Yonkee bison trap, 24PR5 (Bentzen 1966:17-18). Although the feature was not described in the report, it appears from examination of the photograph that this pit was also made from clinker rocks. It was located on the crest of a rocky ridge just as was our structure. Loendorf et al. (1972:26, 28-29) identified an eagle trap close to a tipi ring site (24BH1007) on a

bluff overlooking the Tongue River. This site lies less than five miles (8km) southeast of the project area. Unfortunately, the 1972 report does not describe or illustrate the eagle trap.

### Lithic Debitage

In addition to the artifacts described earlier (figures 6j, 6k and 6i) we collected three gray porcelanite cores, one of which was made from the vitreous type rock. The collection included thirty-three light to dark gray porcelanite flakes, a broken red glassy slag core and several worked porcelanite flakes. Flakes ranged in size from approximately six by five by two centimeters to those no larger than a dime. The small flakes were, however, in the minority. We also collected one red porcelanite flake about the size of a half dollar. There were hundreds of large flakes, cores and nodules on the site's surface. Our small sample size does not reflect this abundance, but it is representative of the types that comprise the lithic debitage.

### Interpretations

This quarry site has probably served as a source of workable stone for prehistoric inhabitants nearly as long as they have been in the area. However, a lack of diagnostic artifacts at the site prohibits our making absolute

statements regarding the time the site was used. Judging from the lithic evidence, we think the site served as a procurement area where the initial toolmaking stages were carried out.

It is likely that the rock structure at 24BH1589 was an eagle catching pit, although its interpretation as a vision quest site cannot, at present, be ruled out. Testing in and around the structure might produce evidence helpful in solving this problem.

#### 24BH1590 After Five Site

##### Site Description

This occupation site is located on a terrace along the north bank of the South Fork of Spring Creek. The area is flat and provides easy access to water during the spring runoff months. Visibility is limited to several hundred yards towards the north and south, but is greater than a mile up and down (east-west) the Spring Creek Valley. Located in the Lower Slope Fan/Terrace eco-zone, the vegetation complex is limited to short prairie grasses, cacti and sage. The elevation of the terrace is 3720 feet (1133.8m); the creek bottom is only ten feet (3.1m) lower than the terrace.

##### Surface Lithic Debitage

In our surface collection from this site there were four flakes of chalcedony and one of red chert. Each of

these flakes is small and weighs about one gram. One flake of red glassy slag and a red porcelanite chip were also discovered. The majority of flakes (a total of 22) were of the light to dark gray porcelanite varieties. Flakes ranged in size from approximately half the size of a dime to nearly 5 by 4.5 by 2.5 centimeters in size.

Artifacts in the surface collection include what seems to be the midsection of an agate projectile point (figure 8a), a worked flake made of red chert (figure 8c) and a small gray porcelanite biface (figure 8b). The agate midsection is undiagnostic but it is large enough to have come from a Late Archaic corner-notched type. The worked flake is broken but a pressure flaked edge suggests that it may have functioned as a small scraper. The porcelanite biface is broken in several places but is rather well flaked on both sides.

### Testing Phase

We dug a one and one-half meter square test trench (T-1) on the terrace about twelve feet (3.7m) in from the edge of the terrace rim. Most lithic debris lay closer to the terrace edge but we were unable to test there because the debris lay directly upon exposed sandstone bedrock.

T 1 was excavated in arbitrary five-inch (12.8cm) levels to a depth of fifteen inches (38.4cm). We screened all earth out of the test trench through a one-quarter



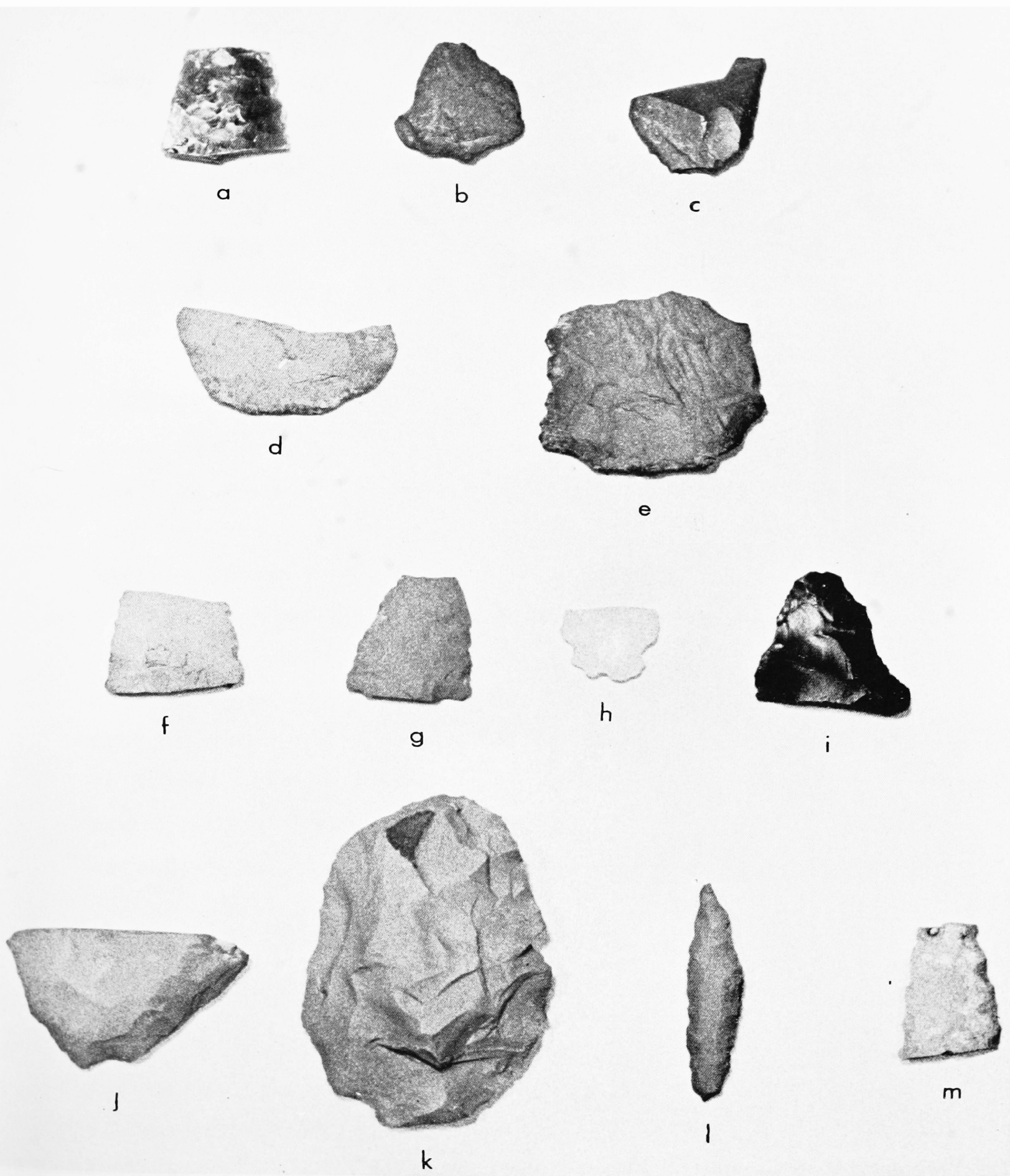


Figure 8. Artifacts: a-c, 24BH1590; d-g, 24BH1591; j-m, BH1593. Actual size.

inch (.64cm) screen and recovered only nine small (less than 3 gram each) porcelanite flakes from the upper level and one porcelanite flake (1 gram) from the middle level. Beginning at 7.5 inches (19.2cm) below the surface, the dirt changed from a fine, light red sandy soil to a flaky, hard-packed light brown, sterile stratum. We did not encounter any cultural evidence in the lowest level.

### Interpretations

This small occupation site (perhaps 100 square yards or 83.6m<sup>2</sup>) cannot be assigned accurately to any particular cultural period because we lack diagnostic artifacts. If the projectile point midsection was, in fact, a corner-notched point (the midsection appears to be too large for a typical Late Hunter side-notched type) the site may date from Late Archaic times, but such an assignment is speculation. This interpretation does not conform to Beckes' (1976) and Haberman's (1973) suggestions that prehistoric populations of the Late Archaic favored different eco-zones, usually at higher elevations.

### 24BH1591 Friday Afternoon Site

#### Site Description

24BH1591 was found on a small bench approximately twenty feet (6.1m) above the south bank of the North Fork of Pearson Creek. Water from the ephemeral North Fork was

readily available during the spring runoff months. In elevation the bench was intermediate (3725 feet, 1135.4m) between the creek and a higher ridge just south of the site. Ridges on either side of the creek restricted the view of the site to less than one hundred yards (30.5m). However, the view up and down the creek (east-west) extended for at least a mile (1.6km).

The site lay in the Moist Slope Ponderosa Pine ecozone. Vegetation included a scattered stand of ponderosa pine, juniper bushes, sage, short prairie grasses, and cacti. The ridges along the site and surrounding pine trees provided good protection from inclement weather.

Other similar benches adjacent to 24BH1591 contained no surface cultural evidence. We did, however, observe four large porcelanite flakes atop a knoll two hundred yards (182.9m) southeast of the site. Investigations above and below the bench revealed no cultural evidence.

### Lithic Debitage

The majority of flakes scattered about the surface were of varying shades of gray porcelanite. We collected forty-one gray and four red porcelanite flakes. Most of these were smaller than a silver dollar, while the six largest flakes averaged approximately 6.5 by 4.5 by 1 centimeters in size. A few were smaller than a dime.

In addition to the porcelanite detritus we picked up one flake each of quartzite, red, and purple mottled

chert. It appears that the flakes (porcelanite and others) resulted from percussion flaking activities.

Artifacts include the midsections of two gray porcelanite projectile points (figures 8f and 8g) and two broken gray porcelanite bifaces (figures 8d and 8e). Unfortunately none of these artifacts can be assigned reliably to any definite time. The specimen illustrated in figure 8g is broken at the base but, judging from its size, may have been a Late Archaic corner-notched point. However, this is only speculation.

The lithic debitage at this site was contained inside a 100 feet by 150 feet area (30.5 x 45.7m). Surface lithic scatter was quite dense indicating the possible presence of subsurface cultural deposits.

### Interpretations

Accurate interpretations involving temporal cultural affiliations of materials at 24BH1591 cannot be made from available surface evidence. The number of artifacts (4) and the variety of lithic material types, coupled with the protected location of the site, indicate the site was utilized as an occupation area. Because of the nature of the surface evidence we were unable to determine what specific activities may have occurred at the site.

24BH1592 The Terry SiteSite Description

The Terry Site was situated on the rim of a cuesta overlooking Pearson Creek to the south. The site lay at an elevation of 3700 feet (1127.8m). A nearly vertical eighty foot (24.4m) drop to the creek bed below rendered access to water very difficult. However, an impressive view of the surrounding terrain was available from this vantage point. Cacti, sage and short prairie grasses covered the ground. This vegetational complex is characteristic of the Upland Prairie eco-zone. There was no protection from inclement weather available at the site.

Based upon an assessment of the surface evidence, 24BH1592 was classified as a chipping station site. Compared to the other sites that we located during our survey this chipping station exhibited an unusual concentration of chipped stone. We discovered eighty-four flakes of various materials concentrated within a one foot square (30.8cm<sup>2</sup>) area. This concentration was located atop the cuesta just a few feet from the rim. Included in the debitage were forty-eight gray porcelanite flakes, thirty-two red porcelanite flakes, three chert flakes, one glassy slag flake, and an unidentifiable tooth fragment. We also encountered a broken gray porcelanite biface (not illustrated) and a red chert uniface fragment (figure 8i). A basal portion of a

corner-notched point (with a basal indentation) made of white quartzite lay on the surface several yards away from the lithic concentration (figure 8h). A small part of a basal ear was broken off.

### Lithic Debitage

The largest of the flakes found in the lithic concentration are roughly the size of a silver dollar. The majority range in size from 1 by 1 by .1 centimeters through 3 by 2.5 by 1 centimeters in size. Flakes were several different colors and probably came from different cores. Although we did not find any very small retouch spalls, some scars suggest that flakes were removed by pressure techniques. Other flakes are obviously the result of percussion flaking.

We encountered difficulties in determining the temporal affiliation of the tri-notched point type. This specimen did not resemble the small side- and basally-notched tri-notch points usually associated with the Late Hunter Period (see Fredlund and Fredlund 1973: figure 8c; Haberman 1973:figure 14a for illustrations of Late Hunter Period tri-notched points). Fredlund and Fredlund (1973: figure 15b) illustrated a point morphologically similar to the Terry Site specimen and refer to it as "Hanna like." Hanna points are often considered to be in the McKean continuum. If this interpretation is correct, the Terry Site

may date as early as the latter part of the Early Archaic Period.

Although over eighty flakes were recovered from a very small area, we did not encounter significant amounts of debitage elsewhere in the estimated fifty-foot square (15.2m<sup>2</sup>) area. In fact, we observed only three or four additional flakes on the flat. The site rests upon a sandstone base covered with only a few inches of mixed sandy loam. These conditions indicate a lack of subsurface cultural deposits.

### Interpretations

This chipping station may be tentatively assigned to the latter part of the Early Archaic Period or the early stages of the Late Archaic. Unlike the situation for other chipping stations in the study area, it is difficult to determine whether or not the site was utilized only once. The large number of flakes and variety of lithic materials suggest the area may have been used several times. This chipping station might have been used occasionally by occupants of the Two Butte Site (24BH1593), an occupation site several hundred yards to the west. However, we know of no way to demonstrate such an association.

### 24BH1593 Two Buttes Site

#### Site Description

This occupation site lies in the Upland Prairies

eco-zone on a flat cuesta. It overlooks Pearson Creek to the south. The site was situated near the rim of the cuesta (elevation 3780 feet or 1152.1m) in a small swale. Although upland ridges normally provide little protection from inclement weather, the immediate site area is well protected by slightly higher elevations surrounding the swale. Apparently most of the swale was once under dry land cultivation. These activities have obscured any portions of the site that may have extended inward from the cuesta rim.

Access to potable water would have been quite difficult from the cuesta. Pearson Creek was the nearest supply and it flows only during the spring runoff months. A very steep sixty-foot high (18.3m) escarpment separates the site area from the creek below.

The location affords a good view overlooking Pearson Creek to the south. The higher terrain that provides protection from inclement weather restricts the view towards the north and east to several hundred yards.

Rolling terrain to the north provides easy access to Spring Creek less than a mile (1.6km) distant. Near Spring Creek there are moderately heavy stands of ponderosa pine, but the Two Buttes Site was covered only by cacti, sage and small clumps of short prairie grasses.

The cuesta rim terminates at a small hillock that abuts the southwestern edge of the site. Located atop the hillock was a small stone pile that measured twenty-one



inches (53.8cm) high, forty inches (102.6cm) in diameter with a circumference of approximately twelve feet (3.7m). The view from the knoll is unrestricted throughout all quadrants. About twenty-five sandstone slabs comprised the stone pile. The slabs were about the size of a platter and were piled in random fashion.

### Lithic Debitage

Porcelanite flakes of varying color shades of gray (we collected 78) occurred most frequently at the site, followed by those of red porcelanite (24). This sample is typical of the surface debitage at 24BH1593. We collected a baseball-sized fragment of a gray porcelanite core. A few (5) of the porcelanite flakes were a bit larger than a silver dollar but most were smaller than a twenty-five cent piece. These smaller flakes appear to be pressure-flaking spalls, indicating perhaps that some toolmaking and/or retouch was performed at the site. The larger flakes show distinct bulbs of percussion.

We collected several utilitarian artifacts including a gray porcelanite awl or punch tool (figure 8-1), a broken portion of a biface (figure 8j), a rough blank or preform (figure 8k), and a projectile point midsection (figure 8m). All of these had been made of gray porcelanite. Each is about the size of a nickel. The awl was discovered just below the surface and perhaps indicates the presence of

some subsurface cultural materials.

The debitage at this site was very dense compared to other occupation sites that were found during the survey. Hundreds of flakes still remain in the estimated 200-foot by 100-foot (61 x 30.5m) rectangular-shaped site area. From this evidence we imply heavy utilization of the area and a probable presence of subsurface cultural deposits.

### Interpretations

We did not encounter (neither did Haberman) other occupation sites in the Upland eco-zone. The location of 24BH1593, then, appears to be somewhat unusual. Judging from the surface artifacts, we infer that the site was used for an economic activity, perhaps hide preparation. Unfortunately, the lack of diagnostic artifacts on the surface makes it impossible for us to examine possible economic and eco-zone relationships in a temporal perspective. It is likely that subsurface cultural deposits may, based upon the presence of a projectile point midsection at the site, contain temporally diagnostic artifacts.

Although at present we cannot demonstrate it, the stone pile atop the nearby hillock may have been associated with the occupation site. Stone piles on the Northern Plains served a variety of purposes: to insure good luck and health, to influence the supernatural, as memorials or perhaps to mark territories (Fox 1976:16). Perhaps the

stone pile at the Two Buttes Site was built for one of these reasons.

### 24BH1594 Root Cellar Site

#### Site Description

Located near (only several feet south) the North Fork of Spring Creek, this site was situated on a terrace (elevation 5700 feet or 1127.8m) in the broad creek bottom. Vegetation characteristic of the creek/terrace eco-zone was present, including cacti, sage and short prairie grasses. The view extended for several miles up and down (west and east) Spring Creek but was limited to less than a half mile (804.7m) by higher terrain towards the north and south. Water would have been available from the creek only during spring runoff months.

We discovered remnants of what was apparently an abandoned homestead on a lower terrace near the site. Although wooden frame structures were no longer extant, domestic debris such as rusted bed springs, broken crockery and milled lumber lay scattered about the area. A partially collapsed earthen root cellar had been built into the terrace bank. The interior contained wooden shelves and a wooden super structure covered with earth. The estimated measurements were seven feet (2.1m) high, eight feet (2.4m) long and four feet (1.2m) wide. A wooden slat door covered the entrance.

Included among the domestic debris was a 1932 Montana vehicle license plate. The registration number was T3-882. "T" indicates the vehicle registered was a truck or pickup; "3" denotes the county (Yellowstone) in which the vehicle was registered and "882" is the registration number. We queried the State of Montana Registrar of Motor Vehicles and Yellowstone County's Registrar Office to ascertain the identity of the registrant. Neither office kept records that far back. It is possible that the homestead was abandoned during the depression years of the 1930s.

#### Surface Lithic Debitage

Only twenty flakes of gray and red porcelanite and one of a red and white banded chert were collected from the surface. They all displayed distinct bulbs of percussion and averaged about the size of a half dollar. Figure 9a illustrates a basal portion of a lanceolate projectile point of gray porcelanite. The specimen is somewhat reminiscent of some early dart points but any definite typological assessment would be highly tenuous. What may have been a knife is depicted in figure 9b. It is also of gray porcelanite. We also found a projectile point tip (figure 9c) made of gray porcelanite. Specimens 9a and 9c are not broken from the same dart point.



Figure 9. Artifacts: a-c, 24BH1594; d-k, 24BH1595. Actual size.

### Testing Phase

We located our test trench atop the highest portion of the terrace near an area of lithic debitage. The one and one-half meter square trench was excavated to a depth of twelve inches (30.8cm) and all earth removed was sifted through a one-quarter inch (.64cm) mesh screen. We did not find any subsurface cultural deposits.

### Interpretations

This creek terrace site presently supports a heavy stand of sage. If similar conditions existed in the past, the area would have been an excellent winter forage habitat for antelope. The projectile points and knife might suggest that hunters ambushed foraging animals as they frequented the winter habitat. The lack of diagnostic attributes on any of the artifacts precludes assigning such speculations to broad time periods.

### 24BH1595 Snakeskin Site

#### Site Description

The Snakeskin Site is an extensive occupation site that lay in the interface of two eco-zones--the Scoria/Sandstone Outcrop zone and the Moist Slope Ponderosa Pine zone. The site extends along both sides of a ridge that runs in a southwest-northeast direction. Its elevation is 3840 feet (1170.4m). The ridge is slightly less than a

half mile (804.6m) north of the North Fork of Spring Creek. The creek bottom is at an elevation of 3720 feet (1133.8m).

The ridge is a sandstone spine with small outcrops along either side. Ponderosa pines cover the ridge top and extend down the north slope. Several small berry bushes also grow along the ridge as well as sage, cacti and short prairie grasses. There is a small, well-protected swale at the northeast end of the ridge. Pines surround the area and, together with nearby high ridges, help protect it from the elements. The view from here overlooks several small drainage gullies and a Spring Creek tributary to the northwest. The heaviest concentrations of lithic debitage were found in this well-protected, low swale. This is also where we located our test trenches.

The small drainage gullies below would have provided a convenient source of drinking water during spring runoff months. This fact, together with the site's excellent location, leads us to believe the area may have been quite attractive for habitation during the spring months.

Twenty or thirty yards (18.3-27.4m) southwest of the swale and on the opposite side of the ridge we encountered more lithic debitage. In this area a small (no more than several hundred square feet) flat juts out from the ridge. From here an excellent view for several miles of the North Fork Valley toward the south and east was available. Actually, it appears that this area may have functioned

as a vantage point to watch for game or the approach of other peoples.

### Surface Lithic Debitage

We collected nearly equal amounts of red (25) and gray (31) porcelanite flakes from the surface of the site. None of the flakes were any larger than a silver dollar; many were much smaller. The majority of the larger flakes appear to be the result of percussion flaking--they have distinct bulbs of percussion. Other smaller specimens are pressure spalls. We collected one red glassy slag flake that was worked irregularly along one edge. In addition, we recovered a fist-size core of gray porcelanite and a small mottled pink quartzite flake.

Artifacts present at the Snakeskin Site were numerous and varied. We collected three plano-convex end scrapers; one of a pink chalcedony (figure 9j), another of agate (figure 9k) and one of purple chert (figure 9i). Two corner-notched projectile points were also discovered, both of gray porcelanite. The larger specimen (figure 9d) is remarkably similar to a projectile point illustrated by Beckes (1976:48) who interpreted it as a Late Archaic type. The other corner-notched point (figure 9f) is also similar to a specimen Haberman (1973:16-17) described as being representative of the Late Archaic. The basal ears on this specimen have been broken off.



Three broken bifaces completed the artifact assemblage. . . One is of a dark gray porcelanite (figure 9e) and likely functioned as a cutting tool. The other two (figures 9g and 9h) appear to have been ovoid in shape before they were broken. They may have been scraping implements. Both were made of light gray porcelanite.

#### Surface Faunal Remains

We collected three second phalanx bones from the south side of the ridge. The specimens were from adult or young adult Bison bison and are badly weathered.

#### Testing Phase

Because of the dense lithic scatter and the number of artifacts within the low swale, we chose to concentrate our testing efforts there. We dug two test trenches, T 1 and T-2.

T-1 was located near the center of the swale in a spot where there are dozens of surface flakes. The trench measured three meters (north-south) by one meter (east-west) and was excavated in arbitrary 5-inch (12.8cm) levels to a depth of 30 inches (76.9cm). We collected from the first eight inches (20.5cm), eleven very small (less than one gram in weight) pressure spalls. All but one were of gray porcelanite. The single exception was of purple chert. We also discovered (from 0-8") (0-20.5cm) nine gray porcelanite

pressure flakes averaging about five grams each and one smaller white chert flake. Two fragments of charred wood and a pinion nut were also collected. The lower 22 inches in the trench were sterile.

We excavated T 2 ten feet (3.0m) north of T-1 in an area where the surface was eroded (channeled) and showed little surface chipping debris. This one meter square pit was excavated in arbitrary five-inch (12.8cm) levels to a depth of ten inches (25.6cm). We found only two small porcelanite pressure flakes in the uppermost level--a fact attributed to surface erosion. This area was situated at the lower part of the slope where one of the small gullies began. The lower five inches (12.8-25.6cm) were culturally sterile.

### Interpretations

The types of projectile points present suggest that 24BH1595 was occupied as early as the Late Archaic Period. Subsequent occupations may have occurred and could possibly be represented by the scarpers and biface. It is also possible that the entire artifact assemblage represents only a single occupation, perhaps of some duration.

Judging from the number of scrapers and bifaces, we suggest that one of the economic activities carried out at the Snakeskin Site may have been hide preparation. It is also apparent from our testing operations that there is a

subsurface cultural layer at least eight inches (12.8cm) thick.

### 24BH1596 Dead Tree Site

#### Site Description

This small chipping station site was several hundred feet east of the occupation area at 24BH1595. Both lay in the Moist Slope/Ponderosa Pine eco-zone near an elevation of 3860 feet (1176.5m). Vegetation at the Dead Tree Site included ponderosa pine, sage, cacti, and short prairie grasses.

Site 24BH1596 was situated at the heads of several small drainage gullies that have cut erratic meanders downslope to a small tributary of the North Fork of Spring Creek. These small gullies may have provided prehistoric occupants with water as the sheltered snowdrifts on the north side of the ridge melted during early spring.

The site location provided a somewhat restricted view throughout most quadrants. A high cuesta rim immediately east and a long ridge (upon which 24BH1595 lies) to the south severely limited visibility. Higher hills several hundred yards towards the north also limited the view. Actually, these features afford excellent protection from inclement weather and made the site area a desirable camping spot. To the west, the downward sloping terrain extends without obstructions for nearly a half-mile (804.6m).

### Lithic Debitage

There was not much chipping debris present on the surface. The flake debitage included only twenty gray porcelanite flakes and two red porcelanite flakes. The largest flake was about the size of a twenty-five cent piece. Some pressure spalls were very small (about  $\frac{1}{2}$ cm<sup>2</sup>). Most appeared to have resulted from pressure flaking, although several larger flakes were from percussion activities. We saw no artifacts on the surface but collected all of the debitage.

### Interpretations

Due to the lack of diagnostic artifacts, 24BH1596 cannot be assigned to a definite cultural period. It is possible that the site was used by the peoples who occupied 24BH1595, but at present we cannot demonstrate any relationships. We do feel that the scarcity of surface detritus and lack of artifacts make it probable that subsurface cultural deposits were not present. These facts lead us to conclude that the site had limited use for stone knapping activities.

### 24BH1597 Outcrop Site

#### Site Description

The unique feature of the Outcrop Site is the

presence of cores, nodules, and percussion flakes of glassy slag (see Geology section) scattered about the surface. It is the only site of this type that we found in the study area. It is difficult to assign the site to a specific category on the basis of the surface evidence; as it was either a small lithic scatter area or a quarry site. Even though we did not discover a nearby glassy slag outcropping it seems most likely that quarry activities were represented. Glassy slags were formed near fissures or vents which supplied oxygen to subsurface burning coal seams (figure 5). Possibly such a vent once existed here, which might account for the glassy slag nodules scattered about the surface.

The site is located on a 2 to 3 percent slope several hundred yards north of the North Fork of Spring Creek near large scoria rock outcroppings. These outcroppings are not the parent source of the glassy slags but they are evidence of old coal burns and extreme high temperatures.

Vegetation included sage and prairie grass, flora characteristic of the interface between a Lower Slope and Scoria/Sandstone Outcrop eco-zone. The site area, at an elevation of 3740 feet (1139.9m) was only 40 feet (12.2m) above the creek bottom. There was no protection from inclement weather but the view was good (as much as several miles to the east and west) in all quadrants. Water would be available during the spring runoff months from Spring Creek.

### Lithic Debitage

Glassy slag specimens from 24BH1597 ranged in color from red to purple to shiny black. Some were banded red and black slags but most were red-colored. One specimen exhibits a dark gray vitreous glassy slag exterior that blends into a vitreous, lighter gray porcelanite interior. This specimen may provide important clues regarding the formation of slags from porcelanite. We also discovered four small (no larger than 4 x 3 x 1cm) gray porcelanite flakes.

The glassy slag flakes seemed to occur in two general sizes--those approximately 5 by 4 by 1.5cm and a smaller group, 2 by 2 by 1cm. All had distinct bulbs of percussion. The slag cores were roughly shaped, demonstrating the poor fracturing qualities of the material. We collected four banded specimens, five red-colored cores, thirty red and purple flakes and ten black slag flakes. The sample is representative of the lithic materials present at the site. We did not discover any artifacts.

### Interpretations

Although the slags do not outcrop at the site, it is highly probable that a vent fissure (see figure 5) once existed here. Glassy slags are formed along fissures that supply oxygen to the burning coal seams below. It is along these fissures that highest temperatures occur.

We were unable to assign this site to a broad temporal

period because there were no diagnostic artifacts at the site. This suggests that only core reduction activities occurred at the site. Frison (1974:61) has explored the possibility of establishing hydration rates for glassy slags (he calls the material non-volcanic natural glass). Although artifacts made from the material do not commonly occur, Frison found some specimens and suggests that if local hydration rates can be determined, such artifacts can be dated. He stressed that quarry sites must be located to accomplish this goal.

#### 24BH1598 Coyote Rock (Figure 10)

##### Site Description

This rock structure was situated atop a prominent hill in the broad (over a mile wide) valley of the North Fork of Spring Creek. The maximum elevation of the hill was 3985 feet (1214.6m); the surrounding terrain averaged about 3900 feet (1188.7m). The view from atop the hill was quite impressive in all directions.

To form the structure, approximately seventy-five scoria rocks have been arranged in a circular fashion around a natural scoria outcrop (figure 10). The lichen-covered natural outcrop measured roughly five feet long (1.5m), four feet wide (1.2m) and three feet high (.9m). The entire structure was approximately thirty-two feet (9.7m) in circumference and averaged eleven and one-half

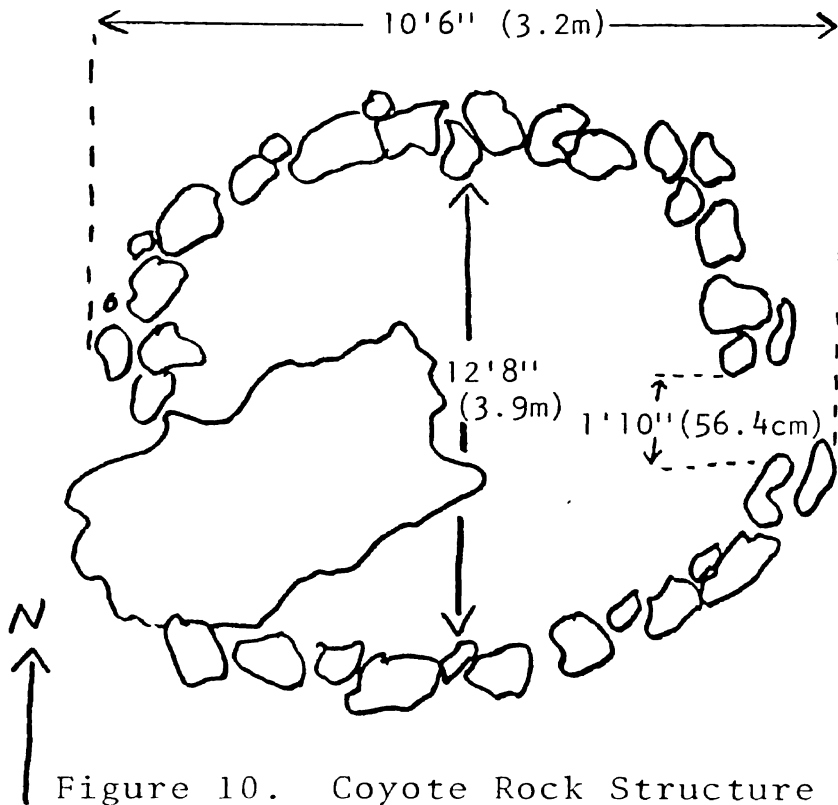


Figure 10. Coyote Rock Structure (24BH1598)

feet (3.5m) in diameter. There was a nearly two-foot wide (.6m) opening facing to the east. The circular stone arrangement was about one and one-half feet (.5m) high.

#### Lithic Debitage

None was observed.

#### Interpretations

The alignment resembles vision quest structures reported by Wedel (1961) in the Pryor Mountains. These structures were U-shaped or oblong with openings often facing toward the east. Wedel also noted that vision quest sites tended to occur at high, nearly inaccessible locations because questors required solitude that only remote moun-



tainous areas could provide. The structure at 24BH1598 does not conform to the latter requirement. However, Good (1975:78) recorded structures near the Pryors that he interpreted as vision quest areas. These phenomena were situated at low elevations, on prominent, but easily accessible, terrain features. Good's observations appear to be applicable to the Coyote Rock structure. Therefore, we suggest that 24BH1598 was a vision questing site. If our interpretations are correct, and coupled with Good's findings, then traditional ideas regarding vision quest site locations might be in need of revision.

#### 24BH1599 Pine Tree Site

##### Site Description

This small chipping station site was found in the interface of the Scoria/Sandstone Ourcrop-Dry Slope Ponderosa Pine eco-zones. The small bench on which the site lay had an elevation (3980 feet or 1213.1m) nearly intermediate between higher ridges to the north (4100 feet or 1249.7m) and the creek valley floor to the south (3920 feet or 1194.8m). . . A heavy stand of pine and juniper surround the site. Other vegetation includes short prairie grasses, sage and berry bushes. The vegetation provides good protection and the high bench allows excellent surveillance of the creek valley to the west, north and east. Higher ridges to the north

limit the view to several hundred yards. Access to water during spring runoff months appears difficult. The nearest water source is Spring Creek, one-half mile (804.6m) north.

### Lithic Debitage

We did not discover any artifacts on the surface of the site. In fact, only nineteen red (3) and gray (16) porcelanite flakes were collected, and these were all that we could find on the surface. The largest flakes were about the size of a twenty-five cent piece; others were no larger than a dime. Most displayed distinctive bulbs of percussion, but there were several pressure spalls present. The small amount of chipping debris present on the surface suggests an absence of subsurface cultural deposits. Also, the soil rests upon a sandstone base and is only several inches deep.

### Interpretations

The Pine Tree Site is apparently a chipping station that was little used. Without diagnostic artifacts it is impossible for us to assign any broad cultural time period affiliations. There may be larger occupation sites on the flats and cuestras above this chipping station, but our contract did not call for surveying those areas.

### 24BH1600 Spring Creek Bluffs Site

### Site Description

This site was only several hundred yards west of a

similar site, 24BH1599, in the same eco-zone. Ponderosa pine and juniper surrounded two small benches which contained scanty lithic debitage. Sage, berry bushes and short prairie grasses were present. The vegetation provided excellent protection and the higher elevation (3980 feet or 1213.1m) afforded a good vantage point overlooking the creek bottom to the west, east and north. Higher terrain to the north restricts the view to several hundred yards. Water would have been available during the spring runoff months from Spring Creek one-half mile (804.7m) north.

It is difficult to place this site into a specific site type on the basis of lithic debitage. We found only five flakes, but we also collected two broken artifacts. Perhaps we might best characterize the site as a sparse lithic scatter area. Judging from the good view and cover available, the site could have also functioned as a vantage point for where movements of game were observed.

### Lithic Debitage

Figures 11a and 11b illustrate the artifact assemblage from the site. The projectile point midsection is of a nearly translucent chalcedony, and the broken biface is of red porcelanite. Unfortunately the projectile point base has been broken thus making it impossible to assign it to a type.

We also collected a piece of a gray porcelanite core (4cm in diameter), a worked flake of red porcelanite (not illustrated), two gray porcelanite fragments and a small

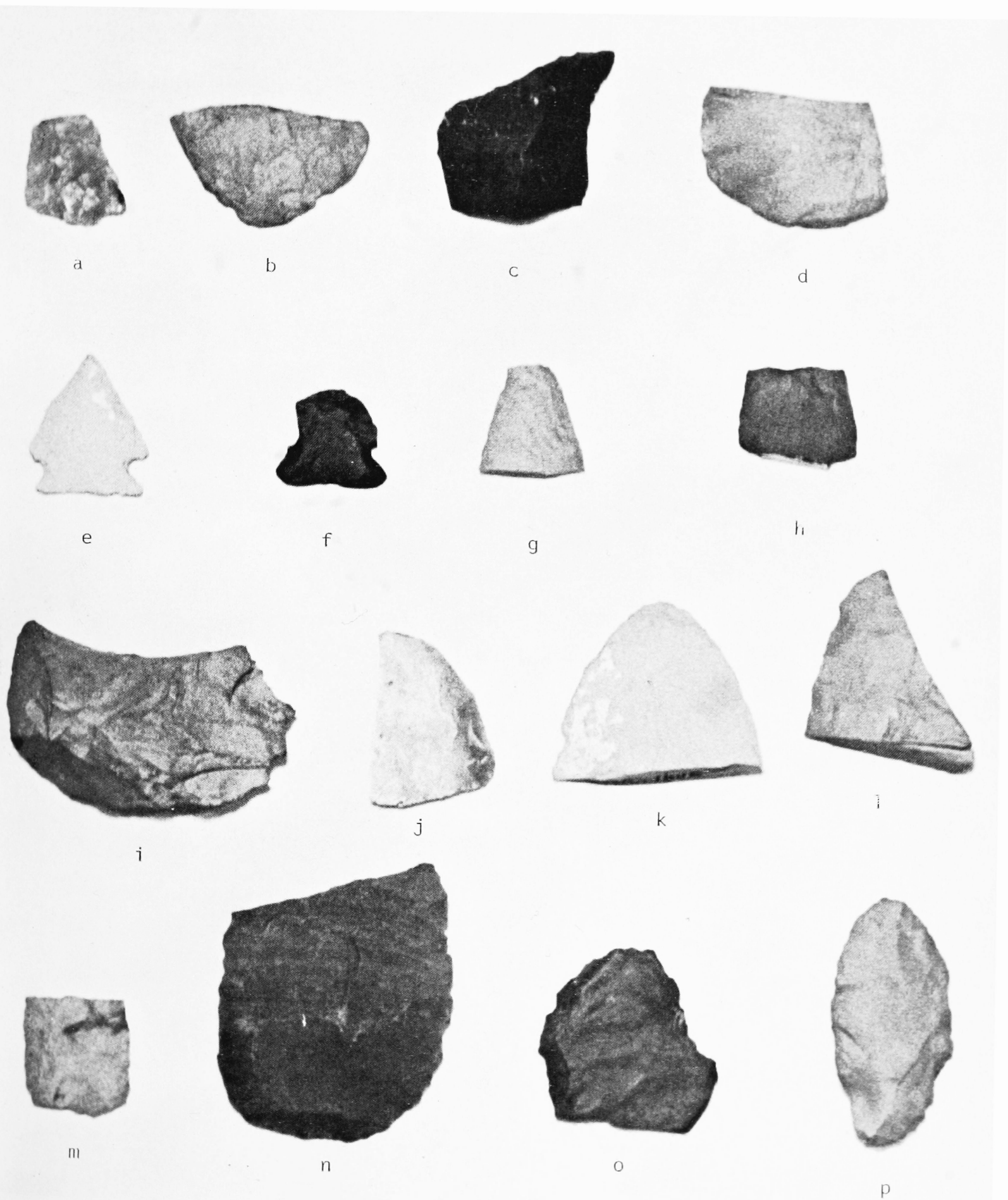


Figure 11. Artifacts: a-b, 24BH1600; c-d, 24BH1601; e-l, 24BH1602; m, 24BH1604; n, 24BH1605. Actual size.

pressure spall of red glassy slag. The porcelanite flakes are about one-third the size of the core.

### Interpretations

This site may have served as an area where an individual made a few stone tools. Judging from the meager surface assemblage and the very shallow soil depth (only several inches) there was no reason to believe that there were any subsurface cultural deposits. Also, because of the lack of diagnostic artifacts we could not place the site into any particular time period.

### 24BH1601 Section Corner Site

#### Site Description

24BH1601 was found on the west side and at the head (elevation 3780 feet or 1152.1m) of an unnamed tributary of the North Fork of Spring Creek. This tributary flows only during the spring runoff months and would probably provide potable water during that time. The lithic scatter area was situated in the Moist Slope Ponderosa Pine eco-zone. There was a dense stand of pine, some juniper bushes, small berry bushes, sage, and prairie grasses on the bank of the tributary. Higher elevations and pine trees surrounded the head of the drainage and provided excellent protection from inclement weather. The visibility is restricted to several hundred feet in all directions. The site is one-half mile

(804.6m) upstream from the Long Bone Occupation Site (24BH1602).

### Lithic Debitage

Figure 11c illustrates the only artifact made from glassy slag that we found during our survey. The pointed end may have functioned as a graver or perforator. The flaking pattern is difficult to see in the illustration but the point has been fashioned by the removal of long flakes. The slanted upper edge also was fashioned by the pressure flaking technique. The only other artifact found at the site was a crude, broken biface of gray porcelanite (figure 11d).

Although there were more gray porcelanite flakes than other materials, light purple chert and red porcelanite chips were present. We collected fifty-five gray porcelanite flakes, two of red porcelanite, one of red glassy slag and two of purple chert. The collection included two rough cores--one of purple chert and another of gray porcelanite. The sample is typical of thedebitage present on the site, but the chipping debris was spread thinly over an area about 400 feet square (121.9m<sup>2</sup>). Flakes ranged in size from six to seven centimeters square (percussion flakes) to as small as a centimeter square (pressure flakes).

### Interpretations

Without diagnostic artifacts it is difficult to assign a date to the occupation at this site. The extent of the

lithic scatter area, the variety of materials and moderate amount of debitage all suggest that the area was used periodically for toolmaking activities. In addition, we found most surface debitage on narrow fingers of land separated by small erosional gullies. These narrow fingers exhibit little or no soil depth because of spring runoff erosion. Consequently, the nearly impenetrable clinker bedrock is often exposed.

### 24BH1602 Long Bone Site

#### Site Description

The occupation site was situated on a terrace immediately west of an unnamed tributary that flows (during spring runoff months) south into the North Fork of Spring Creek. Vegetation other than pine included sage, short prairie grasses and juniper bushes. The terrace (elevation 3740 feet or 1139.9m) was well-protected by higher ridges to the east and west and by the trees and bushes. These features also serve to restrict the view to only several hundred feet maximum in any direction. Water was apparently available only when the tributary was flowing. The eco-zone can be characterized as a Moist Slope Ponderosa Pine.

#### Surface Lithic Debitage

As depicted by figures 11e through 11-1, the site produced a variety and abundance of artifacts, two of which may

be considered temporally diagnostic of the Archaic Period. Figure 11 illustrates a corner-notched specimen of gray porcelanite that is nearly identical in size and shape to a specimen (figure 9f) found at 24BH1595. Both are similar to another projectile point from a project area site (24BH1041) described by Haberman (1973:16-17) as representative of the Late Archaic Period. With the exception of the slight basal indentation, specimen 11f (made of red porcelanite) approximates in shape and size a projectile point illustrated and described by Beckes (1976:20-21) as reminiscent of the Besant type. Besant specimens are usually dated at the latter part of the Late Archaic. Two nondiagnostic midsections complete the projectile point assemblage. One midsection (figure 11g) is of gray porcelanite; the other specimen (figure 11h) is made of red porcelanite.

We also collected four artifacts that were apparently used as cutting tools; a broken biface of red porcelanite (figure 11i), a broken knife made from chalcedony (figure 11j), a knife tip (figure 11k), and a broken knife (figure 11 l), both of gray porcelanite.

Lithic debris at the site also included flakes of red glassy slag (4), quartzite (1), red chert (1), brown chalcedony (1), and gray porcelanite (26). Surprisingly, the flake scatter over the estimated 100 feet by 75 feet (30.5 x 22.9m) site area was sparse. The sample probably represents about half of what was visible on the surface. Some of the flakes



are small (about 1.5cm in diameter) pressure spalls; most are percussion flakes ranging in size from several centimeters in diameter to as large as 5.5 by 4 by 1.0 centimeters in size.

### Surface Faunal Remains

The discovery of four long bone fragments on the surface prompted the name Long Bone Site. The long bones included a right and left humerus, one radius and an ulna. The incomplete closure of the epiphyseal plate on the radius suggests the presence of at least one juvenile individual. These long bones were identified as Bos sp. and all exhibited butchering fractures apparently from predators such as coyote. We feel that these faunal remains date from historic times and probably resulted from winter kill or disease.

In addition to the bones, we also collected two fragments of fossilized shell (species unknown) and several small tooth (enamel) fragments (species unknown).

### Testing Phase

Because of the abundance of artifacts we decided to dig three test trenches at the site. All of the fill from each of the trenches was sifted through a one-quarter inch (.64cm) screen.

T-1 was begun in an area where we found bone fragments and several flakes. The trench was 1.5 meters square. Immediately below the topsoil and at a depth of two inches (5.1cm) we encountered a nearly impenetrable layer of clinker bedrock.

After trying unsuccessfully to dig through the bedrock we backfilled at 4 inches (10.2cm). We found no subsurface cultural evidence at T 1.

We selected an area with some soil depth for T-2. The one meter square trench was excavated in arbitrary 5-inch (5.1cm) levels to a depth of 20 inches (51.8cm). We did not encounter any subsurface cultural evidence at T-2.

The third test trench measured 2.25 meters by 1.5 meters and reached a depth of 4 inches (10.2cm) before we encountered impenetrable bedrock. We discovered flecks of charcoal and charcoal stained earth in the center of the trench at a depth of 2 inches (5.1cm). Associated with the charcoal area, but uncharred, was a rib fragment from either a deer or antelope. Unfortunately, the charcoal and bone samples recovered from T-3 were not large enough for radiocarbon dating. We considered the possibility that the charcoal resulted from an earlier grass fire but the other two test trenches did not, as might be expected, contain such evidence.

### Interpretations

The diagnostic projectile points lead us to suspect that the Long Bone Site was utilized as early as the Late Archaic Period, perhaps in the latter stages. The site lies in the Moist Slope Ponderosa Pine eco-zone at a low elevation. The occurrence of Late Archaic projectile points at lower elevations does not appear to confirm Haberman's (1973)

suggestion that Late Archaic populations preferred upland campsites.

The presence of a variety of cutting tools indicates that 24BH1602 may have been utilized for specific economic purposes such as hide or meat preparation. Another possible interpretation is based upon the occurrence of projectile points at the site. Sheltered pine-covered draws are a favorite habitat of deer and antelope, particularly the former. Perhaps hunters waited in ambush at this favorable spot, killed the game animals and in doing so, lost or broke several projectile points. If so, the cutting tools (and the rib fragment) suggest the animals might have been butchered on the spot.

#### 24BH1603 Transect Site

##### Site Description

This site was a chipping station located atop a small hillock in the gently rolling terrain of the Tongue River Valley. The maximum elevation of the hillock is 3620 feet (1103.4m); the surrounding terrain averages 3560 feet (1085.1m) in elevation. Vegetation at the site included dwarfed juniper, sage and short prairie grasses, flora which is typical of the Lower Slope Fan/Terrace eco-zone.

The view from the hillock is quite good in all directions providing excellent surveillance of surrounding lower terrain. However, the hillock would not have been a desirable

spot during inclement weather. Water was available during the spring runoff months from Spring Creek about a half-mile (.8km) south. The Tongue River flows year around and is a little over a mile (1.6km) southeast of the site.

### Lithic Debitage

We discovered a total of sixteen flakes within a thirty-foot square (9.1m<sup>2</sup>) area. One chip was of a pinkish-brown colored chalcedony, four were red porcelanite and eleven were gray porcelanite. The chalcedony flake may be a pressure flake; the remainder are percussion flakes. They range in size from two to three centimeters in diameter to several as large as a silver dollar. We did not find any artifacts on the surface.

### Interpretations

It is not possible to assign a general date to this site because there were no diagnostic artifacts. The low density of the lithic debitage indicates the chipping station was used sparingly, perhaps while the toolmaker kept watch over the surrounding lowlands. There were no buried cultural items at the site because there was no soil depth--the bed-rock was exposed along the hillock's crest.

### 24BH1604 Cashed-in Cow Site

### Site Description

There were two small concentrations of lithic debitage

at this chipping station site. The site was situated near the crest of a low rolling flat just above (elevation 3560 feet or 1112.5m) and south (about 400 yards or 365.8m) of Spring Creek (elevation 3500 feet or 1066.8m). Several irregularly shaped scoria rock outcroppings occurred in the area. Short prairie grasses cover the flat and gentle slopes. Other vegetation includes sage, a few berry bushes, an occasional juniper and several yucca plants. The plant cover is typical of the Creek Terrace eco-zone. Water would be available from Spring Creek during the spring runoff months. Two miles (3.2km) east is a more reliable water source, the Tongue River.

The flat on which the site was situated is an ancient terrace formed by the Tongue River. The terrace does not provide a particularly good view of the surrounding country so the site was apparently occupied for some other reason than as an observation point. Protection from inclement weather also was not available.

### Lithic Debitage

Both flake concentrations were encountered near scoria rock outcroppings and were located thirty feet (9.1m) apart. We collected a total of twenty-seven flakes from both concentrations. Each nearly ten-foot square (3.0m<sup>2</sup>) area contained roughly the same amount ofdebitage.

We collected only one percussion flake of red colored

chert (3.5 x 1.5 x .5cm) and twenty-six pressure and percussion flakes of gray porcelanite. The large percussion flakes averaged about 6.5 by 5.0 by 1.5 centimeters in size and showed marked bulbs of percussion. Smaller ones ranged in size from 5.0 by 2.5 by .5 centimeters to two centimeters in diameter. Two small pressure flakes were each less than one centimeter in diameter.

Five hundred feet (152.4m) in a south-southwesterly direction from the site we found the midsection of a projectile point (figure 11m). The specimen is thin (.3cm) and exhibits parallel sides. The base has been broken but the point may have once been lanceolate in shape. The broken specimen (of gray porcelanite) is too incomplete to allow assignment to a particular type.

### Interpretations

Sparse amounts of surface debitage and the site's location suggest that subsurface cultural deposits were not present. The site was probably used only once or twice for rough toolmaking activities. We are unable to say when these activities occurred because there were no temporally diagnostic artifacts at the site.

### 24BH1605 Rock Garden Site

#### Site Description

This site sits along a low ridge (elevation 3460 to 3480 feet or 1054.6 to 1060.7m) that tapers easterly into a

flat at the confluence of Spring Creek and an unnamed tributary. The ridge is dotted with scoria rock outcroppings. The area is in the Creek Terrace eco-zone, and the ground was covered with short prairie grasses, sage, cacti, and berry bushes. Water flows during the spring runoff months in Spring Creek; the Tongue River, three-quarters of a mile (1.2km) to the east, flows year around.

The scoria rock outcrops (there are about fifty outcrops along the ridge) could provide excellent concealment and vantage points for watching the flanking creek bottoms and a portion of the Tongue River Valley. Perhaps hunters ambushed grazing game animals from the rock outcrops. Numerous berry bushes (chokecherry?) along the ridge might have been exploited when they were ripe.

### Lithic Debitage

Although we encountered flakes throughout the site area, most were discovered in two concentrations near separate outcrops. Each concentration contained around twelve flakes. As might be expected, most flakes were of gray colored porcelanite (20); other materials included quartzite (1), poor quality pink chalcedony (1), and tan colored chert (2). Flakedebitage varied in size from one square centimeter (pressure spalls) to those about the size of a half dollar. Some of the largest flakes have distinct bulbs of percussion.

We also collected a broken lanceolate biface (figure 11n), a worked flake (figure 11o) and an ovoid biface (figure 11p) from the surface of the site. These tools are not generally useful as time markers, but probably functioned well as cutting and scraping implements. All were made of gray porcelanite.

### Interpretations

The tool assemblage at the Rock Garden Site suggests that specific activities such as butchering occurred there. Another interpretation is that the site was just a tool manufacturing spot (as evidenced by the debitage concentrations). Perhaps hunters worked on artifacts while awaiting desired movements of game. The creek bottoms are known to be favorite summer forage habitats of ungulates, and the outcrops along the ridge would have provided excellent places to lie in wait and watch grazing game animals. Without time-diagnostic artifacts, such activities cannot be placed within the broad temporal framework of the Northwestern Plains.

### 24BH1606 Plenty Flakes Site

#### Site Description

The construction for the roadway of Montana Route 314 destroyed a part of this lithic scatter area. The site was on a small flat situated next to the bases of several small hills to the north, west and south. The hills and moderate



stands of ponderosa pine and juniper provided excellent protection from inclement weather. Small berry bushes, sage and short prairie grasses were also present. A ponderosa pine-juniper vegetation transect (PPJ #3N), presumably related to impact investigations, was located on the site. The area is characteristic of the Moist Slope Ponderosa Pine eco-zone.

Small spring runoff gullies and washes dissect the flat (elevation 3560 to 3580 feet or 1085.1-1091.2m) forming a series of three miniature flats. The gullies feed into a small, unnamed tributary of Spring Creek. During some months, there may be an ephemeral spring nearby, but we were unable to locate its course. It may be that the highway right-of-way has obstructed or diverted the spring's flow.

While the location of the site affords good protection, the view is restricted by the higher hills surrounding it. The only extensive view (several miles) is to the southeast toward the Tongue River.

#### Surface Lithic Debitage

Thirteen individual flake concentrations were found scattered about in the approximately 300 by 100 foot square (91.4 x 30.5m<sup>2</sup>) area. Although debitage was distributed over the entire site, the concentrations of flakes into small piles were perhaps the most unique phenomenon. The numbers



Figure 12. Artifacts: a, 24BH1619; b-i, 24BH1620. Actual size.

and sizes of flakes in each concentration varied, but all were confined to areas no larger than one foot square ( $30.8\text{cm}^2$ ). The most northerly of the small flats had five flake concentrations, the most southerly seven, and the middle (and smallest) flat had only one.

Each of the thirteen concentrations contained only varying shades of gray porcelanite. Most were made up of about ten or twelve large (approximately 8 to 10cm in diameter) flakes, but several piles (3) were comprised of as many as thirty flakes.

The flakes (other than those found concentrated in small areas) at 24BH1606 ranged in size from one-half a centimeter in diameter (pressure flakes) to several times the size of a silver dollar (percussion flakes). Most (approximately 95 percent) averaged 3.0 by 2.5 by .5 centimeters in size or smaller. We collected two large ( $12.5 \times 9 \times 3\text{cm}$  and  $14 \times 8 \times 5\text{cm}$ ) gray colored porcelanite cores, one of which probably functioned as a crude chopper (not illustrated). This particular core has some cortex remaining on one side and is roughly flaked along a half moon-shaped edge. The edge appears to have been knapped into an irregular but sharp cutting edge which was subsequently fractioned by chopping activities. There are at least a half-dozen other porcelanite cores remaining at the site.

Other than the cores, our surface collection included flakes of gray (47) and red (5) porcelanite, purple and red

chert (2), quartzite (1), and glassy slag (1). Actually, our surface sample was less than 10 percent of the total amounts of chipping debris that remain at the site. In fact, we did not disturb any of the individual flake concentrations so that their locations could be mapped at a future date.

Figures 13a and 13b illustrate two of the artifacts found at the Plenty Flakes Site. The porcelanite biface fragment (figure 13a) has been broken near the midsection. The broken side scraper of light gray chert (figure 13b) shows small pressure retouch flaking along the left edge (as illustrated). We also collected a broken, dark gray porcelanite side scraper from the surface (not illustrated). This specimen is 4.5cm long, 3cm wide and .5cm thick; it exhibits fine retouch along one edge only.

#### Surface Faunal Remains

We picked up a tooth fragment at the site and have identified it as an upper molar from a young adult Bison bison. Much of the tooth's crown is missing, making absolute identification difficult. We also discovered another very small (1.2 x .7cm in size) enamel portion of a tooth. This specimen could not be identified.

#### Testing Phase

We began a one and one-half meter square test trench (T-1) on the southerly flat at an area of dense

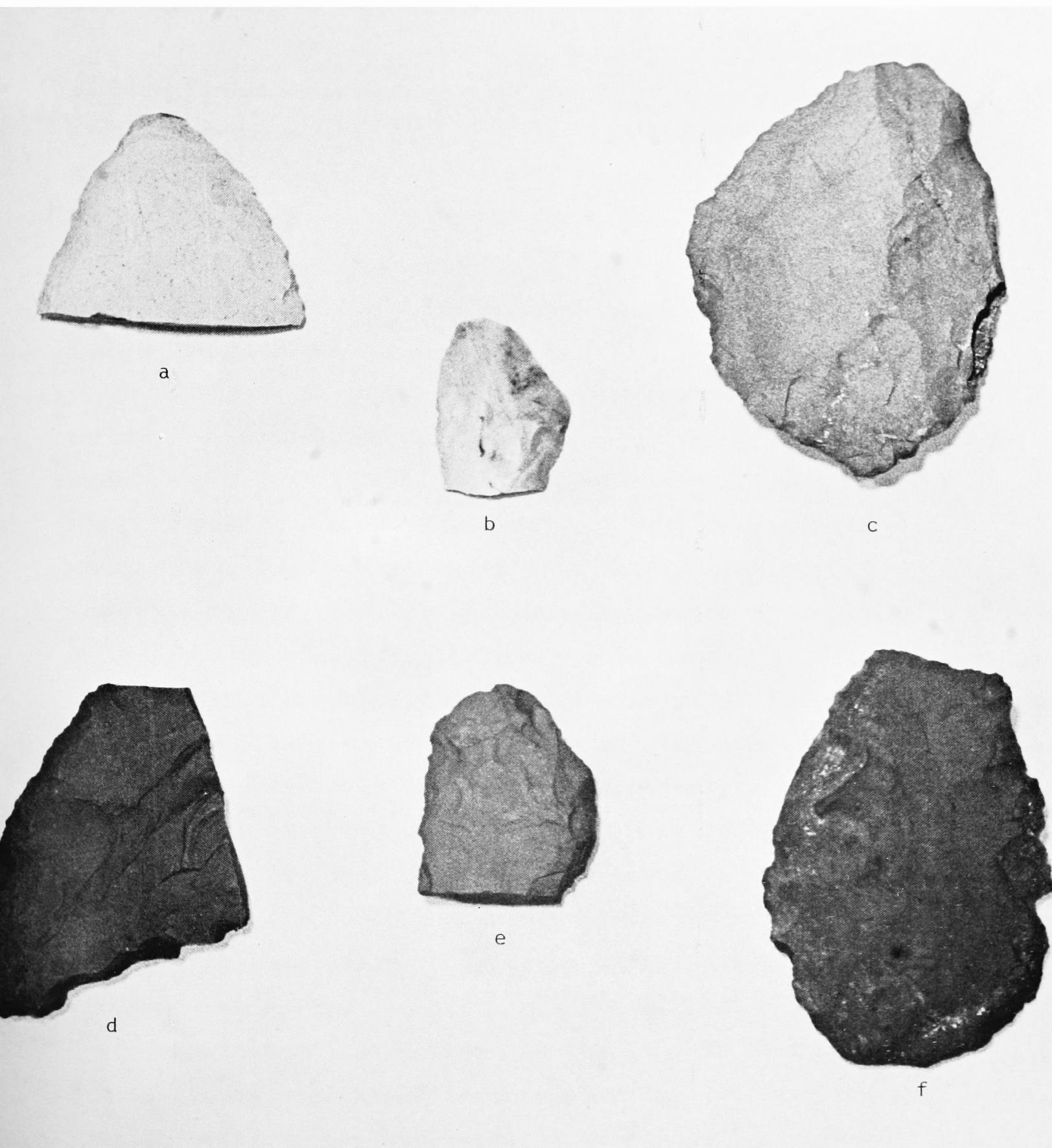


Figure 13. Artifacts: a-b, 24BH1606; c, 24BH1608; d-f, 24BH1609. Actual size.

surface lithic debitage. After removing the first inch (2.6cm) of topsoil we excavated at arbitrarily selected four-inch (10.3cm) levels to a depth of nine inches (23.4cm). All dirt was sifted through a one-quarter inch (.64cm) screen. Occasionally, we selected random samples from the screened back dirt for screening through a smaller one-eighth inch (.32cm) screen.

Prior to beginning excavations, we thoroughly collected the surface area of T-1 and recovered fifty-three light gray and seventeen dark red porcelanite flakes. These flakes ranged in size from less than one-half centimeter square to about the size of a half dollar. About a fourth of the T 1 surface specimens appear to be pressure spalls; the remainder resemble pressure flakes.

In the trench, we recovered a total of sixty-nine porcelanite flakes within the topmost level (surface to one inch or 2.6cm deep). This included forty-nine of gray and twenty of dark red porcelanite. These specimens averaged slightly smaller than those found on the surface of T 1. Most (75 percent or more) appear to be percussion flakes. The level also contained a small, unidentifiable bone fragment and an occasional charcoal fleck.

The second level from the top (one to four inches deep or 2.56-10.2cm) contained seventy gray and six dark red porcelanite flakes. Two were about 5 by 4.5 by 1 centimeters in size (large percussion flakes) and thirty-three were less

than one centimeter in average diameter (pressure spalls). The remaining forty-one flakes ranged in approximate size from dime to half dollar size. Perhaps 75 percent or more of the latter are percussion flakes.

We also discovered a small (1.5 inch thick and 12 inches in diameter) (3.8 x 30.8cm) poorly preserved charcoal lens beginning at 3.5 inches (9cm) below the surface. There was no evidence of a stone hearth or faunal remains associated with the lens. We submitted charcoal from this lens for radiocarbon dating. The results indicate a relatively recent usage ( $290 \pm 115$  years B.P.) (A.D.  $1660 \pm 115$ ) of the site.

In level three (5 inches to nine inches below the surface) (12.8 to 23.1cm) we found only five dime-sized pressure spalls and occasional flecks of charcoal. The flakes were of porcelanite. The fact that there was so little cultural evidence in this level prompted us to excavate a two-foot square ( $61.5\text{cm}^2$ ) pit deeper, below the third level. We extended this pit an additional ten inches (25.6cm) but did not encounter further lithic debitage or other cultural debris.

### Interpretations

From the large amounts of surface and subsurface lithic debitage present at 24BH1606, we infer that the site probably functioned as a workshop where stone tools were



manufactured. The site may have been used only infrequently by several people or periodically by fewer individuals over an extended period of time. Without further evidence it is impossible to resolve this question. Unlike some other lithic scatter sites in the area, the presence of large cores and small pressure spalls indicates the entire tool-making process, from core reduction to fine retouch, was carried out at 24BH1606. The presence of teeth fragments, the scraping implements, the biface, and the chopper suggest that other activities, such as hide preparation or butchering, may have been performed at the Plenty Flakes Site.

The occurrence of such well-defined flake concentrations at the site are difficult to interpret. It has occurred to us that they might be the result of recent idle activities by, perhaps, highway construction workers. However, based upon our knowledge of similar phenomena at other more remote sites in the area, we are inclined to reject this interpretation. We feel that the flake piles were left by aboriginal occupants, perhaps as small caches for later modification into tools or merely as debris from knapping activities.

We did not discover any subsurface artifacts from the test trench; those tools that we collected from the surface of the site were not diagnostic of a major prehistoric period. The radiocarbon date from the subsurface charcoal sample was



dated at  $290 \pm 115$  years ago indicating that the chipping activities occurred fairly recently. However, there is a possibility that the charcoal resulted from a past grass fire. This is a problem that we feel might be solved through additional excavations at the site.

#### 24BH1607 Paucity Point

##### Site Description

This small (50-foot square, estimated) ( $15.2\text{m}^2$ ) chipping station site was located atop a wind-swept, unprotected hillock that overlooks the lower Spring Creek Valley at its confluence with the Tongue River. The elevation was 3660 feet ( $1115.6\text{m}$ ). The view extends for several miles throughout all quadrants. Spring Creek flows during the spring months, but several hundred yards of steep slopes and broken terrain would render access to water difficult.

The area atop the hillock has little or no soil depth. Small chunks of clinker bedrock were exposed, making it difficult for vegetation to take root. There were some clumps of short prairie grasses, a juniper bush and several small berry bushes growing on top of the hillock. This vegetational complex resembles that found in the Upland Prairie eco-zone, but the surrounding flat and rolling terrain and flora fall into the Lower Slope Fan/Terrace eco-zone.

We encountered a small (two feet in diameter,

estimated) (.61m) roughly circular rock alignment atop the hillock. The alignment was only partially exposed making identification (natural or cultural?) difficult. After exposing subsurface portions of the rock we found that it was part of a larger, natural sandstone rock outcropping.

### Lithic Debitage

A thorough ground search of the upper slopes and top of the hillock revealed only sixteen porcelanite flakes (13 gray and 3 red). We did not find any artifacts at the site. All of the flakes exhibited either a distinct bulb of percussion or the ripple marks caused by a percussion blow. There was one dime-sized flake, thirteen about the size of a quarter and two slightly larger than a silver dollar. We removed all of thedebitage present at the surface of the site.

### Interpretations

This is another of the chipping stations common to the area. Many are located at high elevations that provide good overviews of surrounding terrain. This suggests that some chipping stations doubled as lookout areas. If this is true, then it may be that at certain chipping station sites, eco-zonal factors were not important in determining site locations.

A lack of diagnostic artifacts makes it impossible for us to determine cultural relationships or time of

occupation for the site. No subsurface cultural deposits were present because there was so little soil over the bedrock.

### 24BH1608 Red Cliff Site

#### Site Description

24BH1608 is situated on a small terrace that has been cut by several ephemeral drainage gullies that feed into an unnamed tributary of the North Fork of Spring Creek. The tributary has cut a vertical cliff of red clinker opposite (east) the site. The site elevation is 3680 feet (1121.7m); the highest portions of the cliff opposite lie at an elevation of 3740 feet (1139.9m).

The terrace rises gently into slightly higher rolling terrain toward the north and west. A large sloping terrace of the North Fork of Spring Creek extends immediately beyond toward the south. Vegetation includes several ponderosa pine trees, an occasional juniper bush, berry bushes, sage, and short prairie grasses. This complex closely approximates the vegetation of the Lower Slope Fan/Terrace eco-zone.

The site would have been reasonably well protected by the high cliffs to the east and higher rolling terrain toward the north and west, but these features restrict the view to only several hundred yards in those directions. The southerly view of Spring Creek and beyond extends for

approximately one mile (1.6km). During the moist spring months potable water is available from the nearby tributary.

The surface of the site exhibits many ground heaves (see Soil section). We did not discover any cultural evidence on the heaves as was the case at 24BH1610. This lithic scatter area (24BH1610) lay about 500 yards (152.4m) south of the Red Cliff Site (24BH1608).

#### Surface Lithic Debitage

Figure 13c illustrates a gray-colored porcelanite biface discovered at the Red Cliff Site. We also collected a broken worked flake of light gray porcelanite (not illustrated). This specimen is 6 by 4.1 by 1.5 centimeters in size with two roughly flaked edges. Neither worked edge is straight, rather the edges form concentric arcs. Both the biface and the worked flakes were probably used as scraping or cutting tools.

The surface collection included flakes from brown chalcedony (1), dark red (11) and varying shades of gray (55) porcelanite. Flakes ranged from dime-sized to some as large as 6.5 by 5.5 by 1.0 centimeters in size. The majority (about 80 percent) approximated the size of a half dollar or smaller. Nearly all of the flakes exhibit a distinct bulb of percussion or ripple marks resulting from percussion blows. This fact suggests that only rough preforms were

fashioned here; the finished tool was probably manufactured elsewhere.

### Testing Phase

We began a one square meter test trench in an area that appeared to have at least one foot (30.8cm) of soil depth. First the topsoil (surface to a depth of one inch or 2.6cm) was removed. Then we excavated in two arbitrarily selected three-inch (7.8cm) levels to a total depth of seven inches (18.2cm). At that level we met impenetrable layers of clinker rock. All material was sifted through a one-quarter inch (.64cm) screen.

The uppermost level contained only three gray porcelanite flakes. We recovered two porcelanite (gray) flakes from each of the two lower levels. With one exception (3.7 x 2.8 x .3cm) the flakes were the size of a dime or smaller. We did not recover artifacts, other cultural debris or faunal remains from the trench.

### Interpretations

This small (150 x 150 feet or 45.7 x 45.7m) lithic scatter area was probably utilized as a workshop area. We were unable to ascertain whether it was used once or periodically throughout time. The presence of one biface and a scraper tool makes it possible that a specific activity such as hide preparation or butchering may have been carried out here. This site may have been in use at the same time as

24BH1610, an occupation area several hundred yards to the south. At that site (24BH1610) there were cultural deposits to a depth of twenty-four inches (61.5cm).

### 24BH1609 Canyon Rim Site

#### Site Description

This occupation site lay in the North Fork of Spring Creek Valley on a high creek terrace (elevation 3640 feet or 1109.5m). The area was situated 750 feet (228.6m) north of Spring Creek and is bordered to the east and north by higher hills (elevation 3745 feet or 1141.5m). A north-south oriented ephemeral tributary of the North Fork deeply dissects the terrace, cutting a miniature canyon along most of its upper course. The site area was located along a flat immediately east of the small canyon.

Beyond the canyon the gently sloping terrace of Spring Creek continues westward for over one mile (1.6km). This area was dotted with scoria rock outcroppings and contained a major occupation site (24BH1610). Visibility from the Canyon Rim Site towards the southeast (down the Spring Creek Valley) extends for several miles.

Juniper and a few ponderosa pine grow along the canyon rim. Other vegetation included sage and short prairie grasses. There were several scoria rock outcrops in the immediate vicinity. Water would have been available during the spring runoff months from Spring Creek or the unnamed

tributary. The site lies in the Lower Slope Fan/Terrace eco-zone.

Numerous ground heaves dot the site's surface (see Soil section). They are apparently the result of subsurface soil mixing. On one of the heaves we discovered small (2-3cm long) slivers of bone. Test excavations here revealed subsurface bone, charcoal and stone debitage.

#### Surface Lithic Debitage

Figure 13d illustrates a dark red porcelanite biface that was probably used as a cutting tool. The specimen is thin (.7cm) with two roughly worked edges. The top portion and right edge (as illustrated) have been fractured. A second specimen (figure 13e) is broken at the bottom. It is a roughly formed biface of gray porcelanite with cortex remaining on the non-illustrated side. Figure 13f depicts a second dark red porcelanite biface. This specimen is either a cutting/scraping tool or a preform. We also collected a roughly worked biface (not illustrated) or a very poor quality quartz.

Unlike other sites in the study area, most of the lithic debitage at 24BH1609 consisted of dark red porcelanite flakes. Although the debitage extends for approximately 500 feet (152.4m) along the eastern edge of the miniature canyon, we found most of it concentrated on a small flat at the canyon's mouth. Here, hundreds of large percussion

flakes are scattered about an area approximately one hundred feet square (30.5m<sup>2</sup>). This is also where we located our test trench.

We collected fourteen percussion flakes ranging in size from about the size of a half dollar to large flakes averaging 8.5 by 6.0 by 2.0 centimeters in size. Our sample included one dark red porcelanite core about the size of a tennis ball; we observed several other cores on the surface. The nature of the surface debitage (large percussion flakes) and lack of small pressure and retouch flakes suggests that quarrying activities were carried out at 24BH1609. Although we did not discover any porcelanite outcrops in the area, it is possible that the material occurred at one time scattered naturally about the surface. If so, apparently the quarry materials have been nearly exhausted because we did not observe much raw material (porcelanite nodules) laying about the surface.

#### Surface Faunal Remains

The surface of one ground heave near the canyon's mouth exhibited numerous small bone fragments. We collected twelve unidentifiable pieces of bone from this heave. They ranged in size from 3.0 by 1.5 centimeters in size to one-half centimeter square. These fragments were rather badly weathered and very thin (1mm). Based upon our investigations of heaves at 24BH1610 and in the laboratory, we



concluded that the bone fragments had been brought to the surface by unknown soil mixing processes (see Soil section). Thus, we decided to locate our test trench around this ground heave in anticipation of subsurface cultural deposits.

### Testing Phase

After collecting the bone fragments from the ground heave at our test trench, we removed the first inch of top-soil from the one and one-half meter square trench. We found only one small (1.5cm<sup>2</sup>) red porcelanite flake in the first level. However, in the next level (1 inch to four inches or 2.6-10.3cm) we began to encounter small pieces of charcoal and porcelanite flakes. One gray porcelanite flake measured 5.0 by 8.0 by 1.4 centimeters in size; the other three were less than one-fifth that size.

From four to eight inches (10.3-20.5cm) below the surface we discovered flecks and small pieces of charcoal, a portion of a tibia (figure 14a), an upper molar (figure 14b), both identified as Bison bison remains, and tooth (14), rib (2), and long bone (15) fragments, tentatively identified as B. bison. From analysis of the upper molar, the B. bison individual was probably a young adult at the time of death. Four small (less than the size of a dime) gray porcelanite flakes were also collected at eight inches (20.5cm). Unfortunately, our charcoal sample was

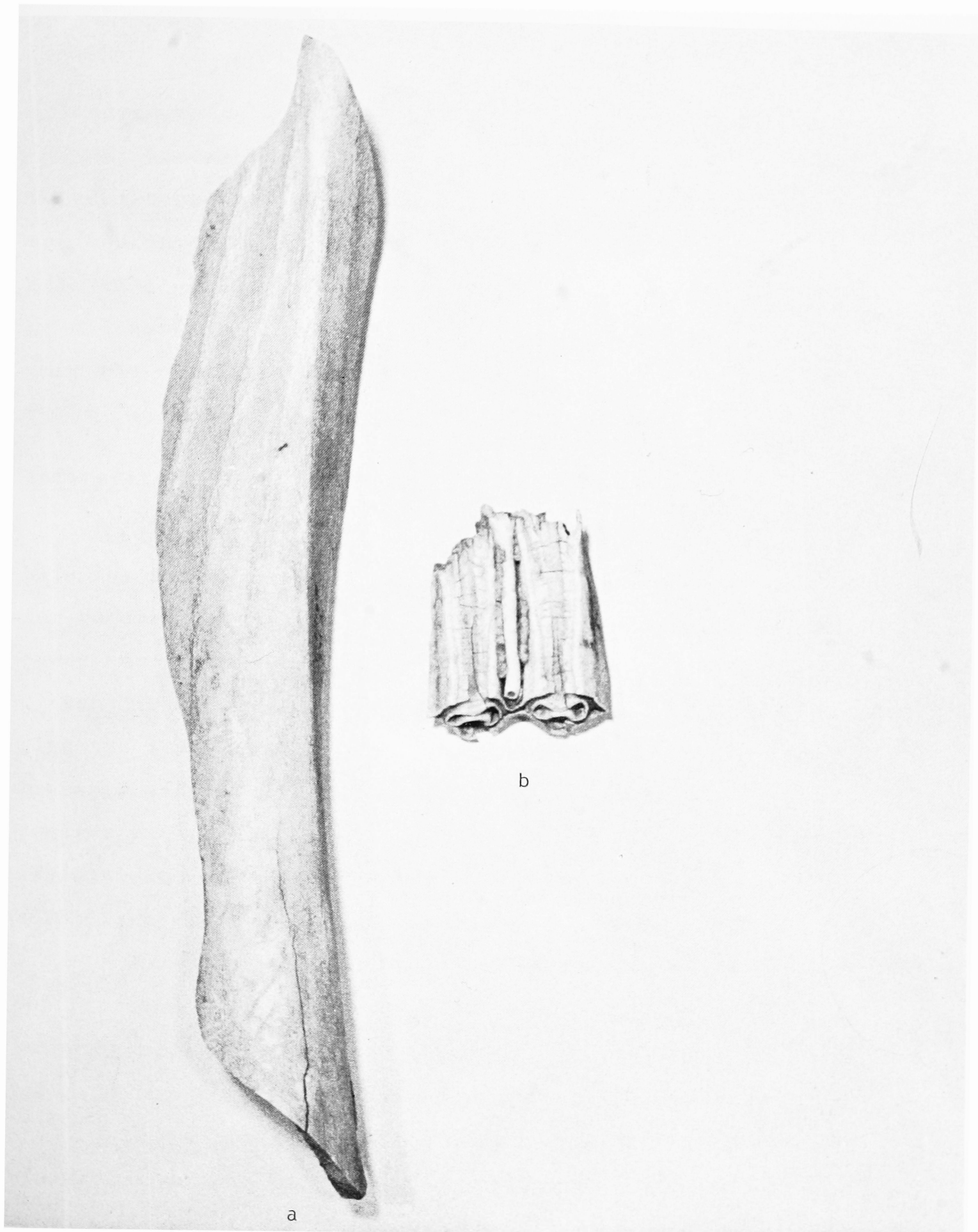


Figure 14. a, tibia fragment; b, upper molar:  
both *Bison bison*, 24BH1609. 86% actual size.

not large enough for C<sub>14</sub> dating purposes.

At eight inches (20.5cm) below the surface we reduced the size of the trench to sixty centimeters square and continued excavating to a depth of sixteen inches (41.0cm). From eight to sixteen inches (20.5-41.0cm) we did not encounter additional cultural debris, suggesting that the cultural depth of 24BH1609 does not extend beyond eight inches (20.5cm) below the surface.

### Interpretations

Apparently 24BH1609 served as an area where porcelain raw materials were obtained and as an occupation area for butchering activities. Unfortunately, we did not discover, during the survey or testing phases, any temporally diagnostic artifacts. Therefore, we cannot at this time assign the site a major prehistoric cultural period. The presence of subsurface cultural deposits indicate that extensive excavations might yield such artifacts. It is possible, based upon the presence of charcoal, that amounts sufficient for C<sub>14</sub> dating may exist below the surface.

The presence of large percussion flakes, cores and one finished stone tool suggests that the entire range of knapping activities (from core reduction to the finished product) may have been carried out at 24BH1609.

It is likely that the tibia fragment (figure 14a) was broken during the butchering process. This evidence,

coupled with additional faunal remains and the presence of two bifaces, a cutting tool, and charcoal indicate that the area also served as a butchering site. Frison (1970:18) suggested that portions of animal carcasses were removed from kill sites (e.g., buffalo jumps, bison traps) to distant butchering areas where detailed butchering activities occurred. Such a practice apparently represents a shift in bison procurement techniques during the Late Archaic Period.

Frison (1968:35; 1970:18) was unable to locate a campsite or area where the meat was further handled after the kill. However, he felt (1968:35) that it was important to find and excavate such a site so that important details about hunting/butchering activities and possibly cyclical movements might be recovered. Since we were unable to find any evidence of bison jumps or traps near 24BH1609, the faunal and tool remains may possibly represent a Late Archaic butchering area as postulated by Frison. More complete excavations at 24BH1609 might resolve this question.

I suggested earlier in this report (see Soil section) that the presence of ground heaves in areas with subsurface cultural materials might be important (and perhaps the only) indicators of prehistoric cultural deposits. This suggestion appears to be valid at 24BH1609 inasmuch as subsurface cultural deposits were found below a ground heave that exhibited bone fragments on the surface. Apparently only very small, light weight bone fragments are carried to the surface

by soil mixing processes. This situation also exists at 24BH1610.

### 24BH1610 Whoop-up and Yell Site

#### Site Description

This extensive occupation site was situated on a gently sloping (2 to 4 percent) terrace that is defined by two small, unnamed ephemeral drainages on the east and the west, and by the North Fork of Spring Creek toward the south. Numerous scoria rock outcroppings dot the terrace.

The creek that forms the eastern boundary of the approximately ten-acre (4.05 hectares) site has cut a miniature canyon along its course. In contrast, the drainage on the western edge resembles a dry wash or gully. Both are oriented north-south and discharge spring runoff waters into the North Fork of Spring Creek. Spring Creek has cut a nearly vertical cliff twenty feet (6.1m) high across the southern portions of the terrace. Toward the north, the terrace slope increases slightly, blending into small ridges and hillocks. The terrace elevation varies between 3640 and 3680 feet (1109.5-1121.7m).

A few juniper and ponderosa pine grow along the eastern edge of the site. The remainder of the site was treeless, covered only by sage and short prairie grass. A few berry bushes were also present. The site lies in the Lower Slope Fan/Terrace eco-zone.

The terrace appears to receive some protection from inclement weather from hills (elevation 3745 feet or 1141.5m) one-half mile (.8km) east and slightly higher terrain (approximately 3700 feet or 1127.8m) toward the north and west. Lower elevations (approximately 3600 feet or 1097.3km) extend in a southerly direction for approximately one-half mile (.8km) before rising into the hills and ridges that separate the North Fork from the South Fork of Spring Creek. The view to the west does not exceed two miles (3.2km) and is less than one-half mile (.8km) toward the south and east. The upper portions of the terrace restrict the northerly view to only several hundred yards. Potable water from either of the flanking drainages or Spring Creek was apparently available only during the spring runoff months.

One of the most intriguing features of the site is the occurrence of ground heaves. Hundreds of heaves dot the surface of the site. They were apparently formed by a yet unknown soil mixing process that brings subsurface deposits to the surface (see Soil section). At 24BH1610, we discovered two ground heaves with small fragments of charcoal and bone upon their surfaces. Subsequent testing at one of these heaves revealed subsurface cultural deposits to a depth of twenty-four inches (61.5cm).

#### Surface Lithic Debitage

Most of the surface debitage occurred on the lower

portions of the terrace along the western edge. Debitage was most often found scattered around scoria rock outcroppings, although flakes and cores occurred throughout the site. Near the western drainage system we found an area with hundreds of flakes scattered over the surface. Of the forty or fifty ground heaves in this specific area, two exhibited surface evidence of charcoal and bone.

Perhaps 70 percent of the surface flakes and cores at 24BH1610 were large gray porcelanite (some as large as 12.2 x 7.7 x 3.8cm in size) percussion flakes. The remainder were nearly all smaller gray porcelanite spalls. Our surface collection included several cores ranging from 10.0 by 6.5 by 3.1 centimeters in size to about the size of a tennis ball. Larger porcelanite flakes averaged six to seven centimeters square and one to two centimeters thick. We also collected smaller percussion flakes ranging from dime-sized to no larger than a half dollar. Some of the smallest flakes may have resulted from pressure flaking activities. Our collection also included one mottled, cream-colored chert flake from a milky but translucent chalcedony. It should be noted that the sample size (32 flakes) is not indicative of the large amount of flakes (perhaps several hundred) that remain at the site.

Based on types, the earliest projectile point that we found during our work in the project area came from 24BH1610. It was discovered at the eastern edge of the

site. This specimen (figure 15a) is a Duncan point made from red porcelanite and is typologically characteristic of the Early Archaic Period. Mulloy (1954b:432-460) included Duncan points in what he defines as the McKean continuum. A radiocarbon date of  $3287 \pm 600$  B.P. (1337 B.C.  $\pm$  600) was obtained from the McKean Site, the type site for the McKean continuum. Elsewhere on the Northern Plains, dates for McKean specimens range from 5000 to 3000 years ago.

One of the typologically youngest projectile point specimens that we recovered during our work also came from the surface of 24BH1610. This specimen (figure 15b) is a side-notched projectile point of gray porcelanite. It is characteristic of projectile points from the Late Hunter Period. These two specimens suggest that 24BH1610 may have been occupied periodically for as much as 5000 years.

In addition to the projectile points, we also found several other artifacts on the surface of 24BH1610. Figure 15c illustrates the tip of a broken gray porcelanite biface. The artifact depicted in figure 15d is also broken, but only at the very tip. All of the edges have been worked. The right edge appears to be serrated, perhaps for cutting purposes. A broken dark gray porcelanite biface (figure 15e) was extensively worked on both edges. It may also have functioned as a cutting tool. Figure 15f portrays a thin flake of gray porcelanite that was beveled along the right



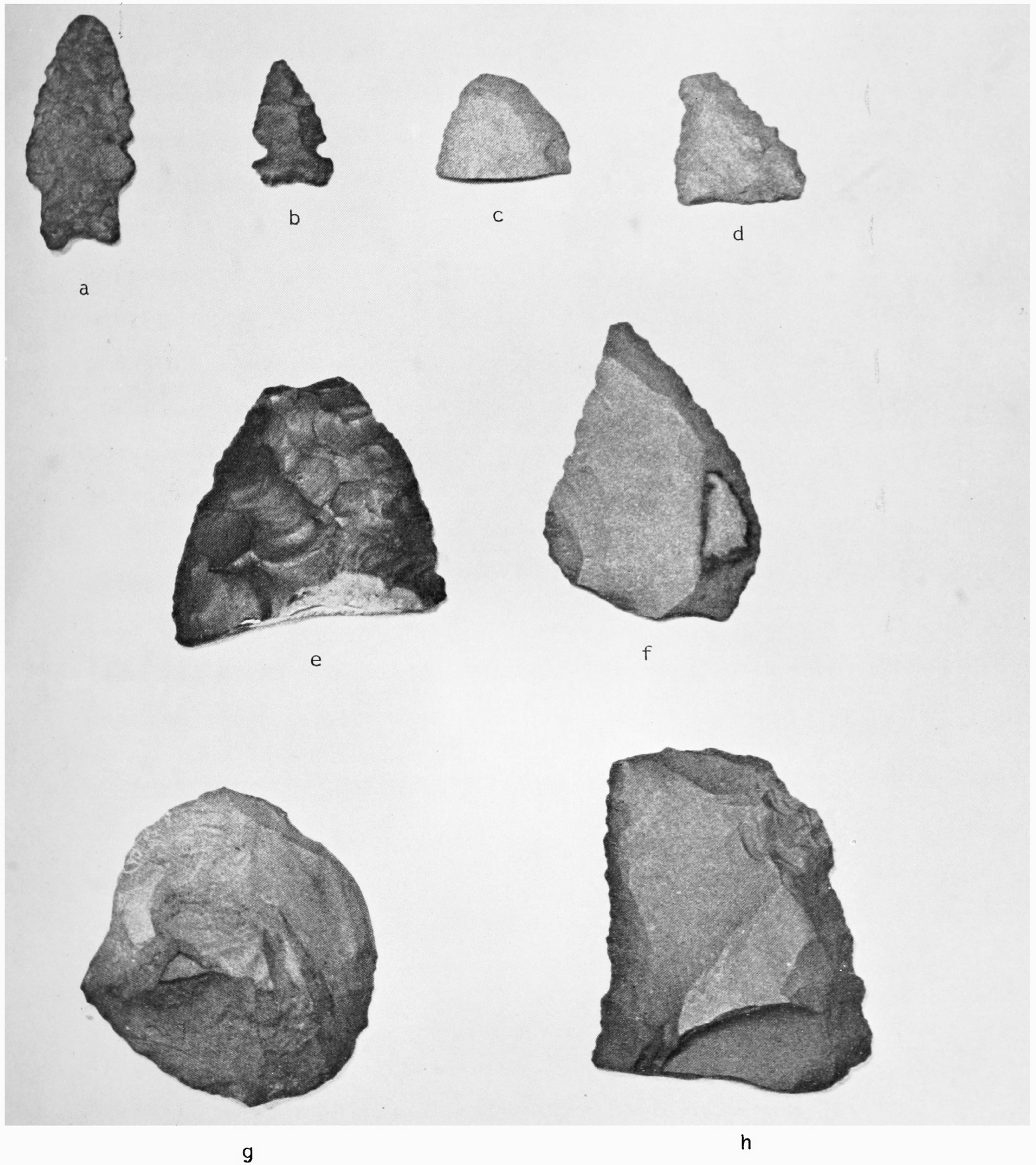


Figure 15. Artifacts: Surface collection, 24BH1610. Actual size.

edge. This specimen was probably used as a side scraper. What appears to be a portion of a gray porcelanite core (figure 15g) was flaked along the lower edge to form a rather crude end scraper. This edge exhibits some re-touch. Figure 15h illustrates a worked flake of gray porcelanite. The right edge of the flake is badly scarred from percussion blows; the opposite edge exhibits pressure flaking on one side and percussion scars on the other. The specimen has been broken at the top and bottom edges and was, judging from the percussion scars, utilized as a chopping tool.

The cutting and scraping implements indicate that extensive butchering and/or hide preparation activities were carried out at 24BH1610. Bone fragments from the surface and butchered bone found in subsurface strata tend to confirm this suggestion.

#### Surface Faunal Remains

As mentioned earlier, we discovered bone fragments on two of the many ground heaves at 24BH1610. Most of these fragments were very small (4.9 x 1.1 x .6cm in size and smaller), but we did find an epiphyseal cap from a Bison bison metacarpal. We also discovered four unidentifiable fragments of burnt bone on the surface of one of the ground heaves. In addition, we removed a badly weathered fused radius and ulna (B. bison) from a cut bank in the southwestern

portion of the site. The olecranon process of the radius has been nearly destroyed, perhaps by scavenging coyotes. Nearly complete fusion of the radius and ulna indicates the animal was mature at the time of death.

### Testing Phase

The trench at 24BH1610 measured three meters long (east-west axis) and one meter wide (north-south axis) and was placed around one of the ground heaves that exhibited surface evidence of charcoal and bone. We discovered similar surface evidence at a ground heave two hundred twenty-five feet (68.6m) south of our trench. Time limitations prohibited test investigations at the second ground heave. However, based on the discovery of subsurface cultural deposits at T-1, we are confident that excavations at the southern heave will also reveal cultural data.

We excavated eight arbitrarily selected levels (T-1 1 through T 1-8) at the test area. The levels and corresponding depths are listed below.

<u>LEVEL</u>	<u>DEPTH</u>
T-1-1	0"-1" (0-2.6cm)
T-1-2	1"-4" (2.6-10.2cm)
T-1-3	4"-7" (10.2-17.9cm)
T 1-4	7"-10" (17.9-25.6cm)
T-1-5	10"-13" (25.6-33.3cm)
T-1-6	13"-17" (33.3-48.7cm)
T-1-7	17"-21" (48.7-53.8cm)
T-1-8	21"-24" (53.8-61.5cm)

Beginning at T-1-6 it became evident that we were nearing the floor of an occupation level. Prior to T-1-6,

each level contained small rib fragments and other small, unidentifiable bone pieces. But, at T-1-6 we began to encounter larger bone specimens (such as radii, ulnae, metacarpals, phalanges, and vertebrae from Bison bison) and unmodified stone (perhaps a fire hearth). Therefore, for control purposes, we increased our arbitrary levels from three (7.7cm) to four inches (10.2cm) and continued our excavations with a hand trowel. At a depth of twenty-four inches (61.5cm) we reached what apparently was the cultural floor of the occupation level. Bone, what may be fire hearth stones, and associated charcoal occurred twenty-four inches (61.5cm) below the surface.

Although each level contained deposits of charcoal, bone and lithic debitage; we feel that the entire assemblage (from 1 inch to twenty-four inches or 2.6-61.5cm) represents one cultural level. There are several reasons for this interpretation. First, we did not encounter breaks in the natural stratigraphy. The consistency and color of the lightly compacted, fine grained, pinkish-red loam remained the same throughout the trench. Had different strata once been present, it is reasonable to assume that the soil consistency would not remain so uniform. Secondly, our test trench encompassed ground heaves and adjacent areas that were not affected by the heaves. Except for surface appearances, these adjacent areas exhibited deposits identical to the soil conditions directly below the heaves. Thirdly,

three radiocarbon ( $C_{14}$ ) dates from charcoal samples collected from various levels of T 1 tend to cluster between 410 B.P. and 490 B.P. These dates came from samples from the surface of the trench, level four and at twenty-four inches (61.5cm).

It should also be noted that we did not excavate the entire three meter by one meter trench to a depth of twenty-four inches (61.5cm). After we began to excavate by hand trowel (at T-1-6 for control purposes) time limitations forced us to concentrate our efforts at the west half of the trench. This was the area in which we had been recovering the most cultural debris. Therefore, the east half of T-1 reached a depth of twelve inches (30.8cm); the west half a depth of twenty-four inches (61.5cm).

#### Subsurface Charcoal

Although we encountered charcoal in all levels of T 1, the three lower levels contained the largest amounts. Chunks of charcoal exceeding a hundred grams were found associated with butchered bone (B. bison) and several stones from what is apparently a badly disturbed fire hearth. In contrast, single charcoal samples from each level from T-1 1 through T-1-5 did not exceed several grams in weight and three to four centimeters in diameter.

#### Subsurface Lithic Debitage

T-1 1 and T-1-2. Chipped stone debris from these two levels ranged in size from small (less than 1cm<sup>2</sup>) pressure flakes to one large percussion spall 9.0 by 5.2 by 1.1 centimeters in size. Most flakes were the size of a half dollar or smaller. The debitage (40 flakes) came from gray porcelanite. Figure 16d illustrates a worked flake of gray porcelanite from T-1-2. The flake is worked along each edge and probably functioned as a cutting and/or scraping tool.

T 1 3. This level contained about the same proportions of pressure and percussion flakes as did the upper two levels. The pressure spalls (about 20 total) averaged less than one centimeter square in size. Percussion flakes (14 total) seemed to cluster around two average sizes, dime-sized or five to six centimeters square. We also recovered a small cutting tool (figure 16b) from T-1-3. Although the illustration displays only one cutting edge, there is another pressure flaked edge on the opposite face of the tool. Figure 16c depicts a very small projectile point, also from T-1-3. The base has been partially broken from this specimen. Both the cutting tool and projectile point are made of gray porcelanite.

T-1-4. The only artifact collected from level four is illustrated in figure 16a. It is broken biface with rough, serrated edges. This specimen is made from gray porcelanite and was probably used as a cutting tool. We



Figure 16. Artifacts: Subsurface collection, 24BH1610. Actual size.

also recovered ten percussion flakes, all of gray porcelanite, from this level. They averaged about the size of a half dollar. Included in our collection from T 1-4 was one flake of white quartzite and ten small (less than one centimeter square) pressure flakes of porcelanite.

T-1-5. This level did not contain artifacts. We collected sixteen gray porcelanite flakes ranging in size from less than a centimeter square to about the size of a silver dollar. Some of the larger flakes were very thin (less than 2cm in thickness). Two flakes of tan quartzite completed our sample of eighteen.

Each of the three lowest levels contained less lithic debitage in comparison to the five upper levels. This decrease reflects our decision to discontinue excavations at the eastern half of the trench after completing T-1-5.

T-1-6. We recovered only eleven gray porcelanite flakes from this level. One large percussion flake measured 9.3 by 5.2 by 1.5 centimeters in size. The remainder were about half the size of a nickel.

T-1 7. This level contained flakes of red chert (1), tan quartzite (2), and gray porcelanite (5). There were no artifacts at this level or at T 1-8.

T 1-8. One obsidian spall, two of quartzite and thirteen porcelanite flakes were recovered from the lowest level. Flakes from this level and T 1 7 averaged two or



three centimeters in diameter or less.

### Subsurface Faunal Remains

T-1 1 and T 1-2. These levels extended to a total depth of three inches (7.7cm) beneath the surface. None of the fifty-nine bone fragments recovered from this depth exceeded 9.3 centimeters in length or 4.4 centimeters in width. Most (56 percent) were very small, weighing less than one gram each. The remainder averaged about seven by three by two centimeters in size. The fragmentary nature of most of the bone prohibited specific identification (e.g., radius, ulna, etc.). We did, however, identify several vertebrae fragments, a portion of a humerus, rib fragments and a second mandibular molar. The molar is from a coyote (Canis latrans). Based upon identifiable faunal remains directly below (Bison bison), we are reasonably certain that the remains from levels one and two are also B. bison. Our bone collection also included fragments of charred cancellous bone and boiled bone.

T-1-3. With the exception of a distal end of a metacarpal (B. bison) (figure 18c), the bone assemblage at this level was nearly identical to the remains in the upper two levels. We did encounter fragments from a second metacarpal (figure 18d), vertebrae fragments, portions of an ulna and a humerus, an olecranon process (from a radius), and rib fragments (all B. bison). The remaining forty-nine

fragments were unidentifiable. There was no boiled bone in this level, but we did collect several burnt bone fragments.

T-1-4. Of the twenty-four pieces of bone from the fourth level, we were able to discern portions of a humerus, rib fragments, vertebrae, radius, and ulna pieces. Burnt bone also occurred in T 1-4. Most of the fragments were no larger than 8.5 by 2.7 by 1.0 centimeters in size.

T-1-5. Burnt bone continued through level five. Also, we discovered several more fragments of boiled bone at this level. Identifiable pieces included vertebrae fragments and several rib portions (B. bison). The total collection included twenty-seven pieces all about the same size as the assemblage from the fourth level.

T 1-6. We collected only seven bone fragments from this level, one of which was identified as an olecranon process from a radius (B. bison). Many of the larger bone fragments that are included in the samples from T 1 7 and T-1-8 were initially exposed at the bottom of this level. We also began to find large (over 100 grams) chunks of charcoal in association with bone and hearth stones. There are two bone pieces and a stone just to the right of the trowel. The three dark spots above the trowel are upper parts of chunks of charcoal. Figure 16a illustrates the association of twenty-four inches (61.5cm).

T-1-7. Figure 17a portrays the olecranon process of

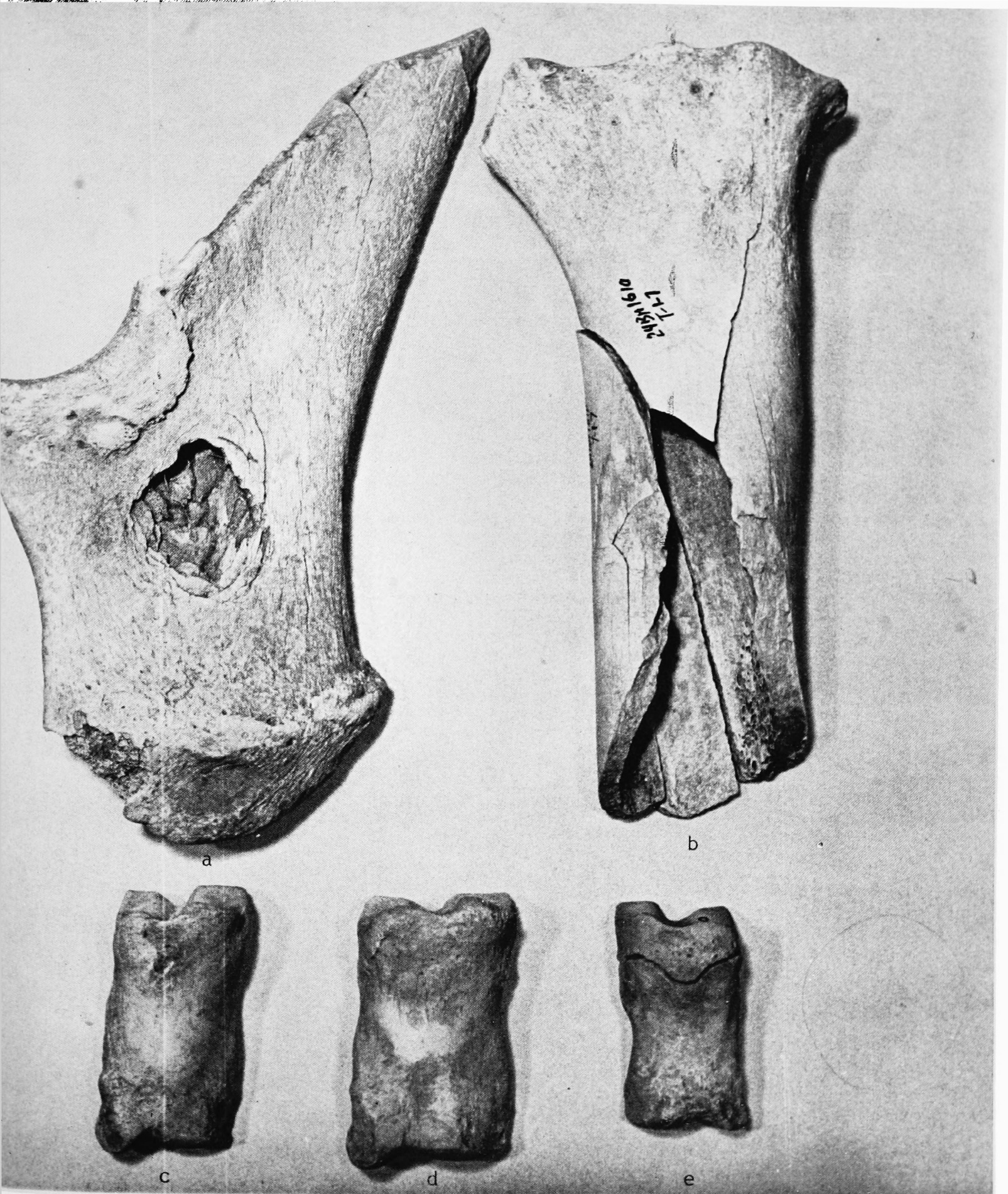


Figure 17. a, olecranon process; b, ulna; c, phalanx; d, phalanx, adult male; e, phalanx; all from Bison bison, 24BH1610. 85% actual size.





Figure 18. a-c, metacarpals; d, epiphyseal cap, metacarpal; e, upper; fetal rib; lower: incisor, fetal; all from Bison bison, 24BH1610. 85% actual size.

a radius (B.bison). The interior surface of the bone exhibits a wound that did not heal. This indicates that the wound was inflicted at or shortly before the time of death. The proximal end of an ulna (figure 17b) and a first phalanx (figure 17c) came from this level (B. bison). Other large butchered bone fragments included the proximal ends of two ulnae, a metacarpal, pieces of ribs, long bones and metacarpals all from B. bison. There were also nine unidentifiable slivers of bone.

T 1-8. We identified several fragments of boiled bone at this level. A rib (figure 18e, upper), a deciduous incisor (figure 18e, lower), and a vertebra fragment from a fetal or newborn bison were also collected. Partial to incomplete epiphyseal closure of two metacarpals (figures 18a and 18b) suggest that some immature bison were butchered at this site. There is also incomplete epiphyseal closure on a second phalanx (B. bison) (figure 17e) discovered at this level. Figure 17d illustrates, for comparative purposes, a second phalanx from an adult bison recovered from another site.

We also collected a first phalanx, another metacarpal and metacarpal shaft fragments at the lowest level, all from B. bison. Unidentifiable bone fragments numbered twenty and averaged about three or four centimeters long.

Most of the bison bone from T 1-8 were in association with charcoal and what may be hearth stones. However,

these stones did not exhibit any evidence of fire cracking and they did not appear to be arranged in any particular fashion (e.g., circular). There is a possibility that they were used as hammerstones or choppers during the butchering process.

### Interpretations

The Whoop-up and Yell Site probably has been occupied sporadically over the last three to five thousand years. These time estimates are derived from projectile points found at the site that are typologically characteristic of specimens from the Early Archaic Period (Duncan point, figure 15a) and the Late Hunter Period (plains side-notched, figure 15b).

More specific dates were obtained from C<sub>14</sub> analysis on charcoal samples collected from the test trench. These dates are based upon the Libby half-life of 5570 years. The age (years before the present) is referenced to the year A.D. 1950. It should be noted that the C<sub>14</sub> dates apply only to the charcoal deposits from our test trench. As indicated by the Early Archaic projectile point, there may be other, earlier deposits throughout the site. The radiocarbon dates are as follows:

<u>LEVEL</u>	<u>DATE</u>
T-1 (surface)	410±135 yrs. BP (AD1540±135)
T-1-4	315±125 yrs. BP (AD1635±125)
T 1-5	710±135 yrs. BP (AD1240±135)
T 1-8	490±125 yrs. BP (AD1460±125)
T 1-8	595±115 yrs. BP (AD1355±115)

The mean date derived from these samples is  $504 \pm 127$  years before the present. None of the dates listed above have been recalibrated using bristle cone pine correction factors.

Surface artifactual evidence suggests that the site area was utilized for a specific economic purpose, that of butchering and perhaps hide preparation, or both. We discovered faunal remains of Bison bison as well as utilitarian tools such as stone knives, scrapers and choppers. These types of tools were most often used during the butchering process.

Some of the ground heaves at 24BH1610 were excellent indicators of subsurface cultural deposits. We found two heaves that exhibited surface deposits of bone and charcoal. Subsequent test excavations at and around one of the heaves revealed significant cultural data.

Our test trench uncovered evidence of butchered bison bone. Judging from the presence of a deciduous incisor, a rib and a vertebra fragment from a late term fetal or newborn bison calf, the butchering activities at 24BH1610 probably occurred during the calving season, perhaps April or May. Three metacarpal fragments (B. bison) display a degree of epiphyseal fusion characteristic of four years of age or younger. This would also place the kill season near April or May.

We collected remains from at least five individuals

from the test pit and the surface of the site. Age distribution at time of death ranged from fetal or newborn to mature adult. A fused radius and ulna (mature individual) came from the site's surface; the remaining evidence was discovered below the surface.

Another pattern visible from the deposition of bison bone at T 1 is that of selective butchering of bison carcasses. Except for the incisor, we found no evidence of crania. There were also no bones from the hindquarters. In fact, we discovered only ulnae, humerii, radii, phalanges, and metacarpals. All of these bones are from the front limbs suggesting that only bison forequarters were butchered here. This evidence invites several possible interpretations. First, the entire site may be interpreted as an area where only the front portions of bison were butchered. However, it is likely that our excavations have revealed an area within the site where selective butchering of forequarters occurred or where less desirable portions of the carcass were discarded. Whichever interpretation is correct, it is probable that the butchering activities at 24BH1610 represent secondary butchering processes. That is, apparently only certain parts of the animal were prepared at the site. Since there is no evidence of bison traps or bison jumps at or in the immediate vicinity of the site, we suggest that selected portions of the carcass were removed from a kill site to 24BH1610 where detailed butchering was accomplished.



Frison (1970:33) postulated that sometime during the Late Archaic Period, changes in bison carcass handling occurred. The second level (Early Archaic) at the Kobold Site, about ten miles north of 24BH1610, exhibited evidence that butchering activities were carried out at the buffalo jump kill site. The Late Archaic stratum (third level) revealed a relative (to Level II) scarcity of bones which indicated there had been a change in carcass handling and butchering procedure. According to Frison (1968:35), these changes involved removing selected portions of carcasses to campsites or areas where the meat was further handled. Based upon Frison's observations, radiocarbon dates and our interpretations regarding the function of 24BH1610, it is possible that the bone deposits at the Whoop-up and Yell Site represent secondary butchering practices that date from the Late Hunter Period, probably circa A.D.1500. This would seem to suggest that butchering techniques that may have begun during the Late Archaic Period persisted well into the latter stages of the Late Hunter Period.

Frison (1970:23) also noticed few humerii, radii and metacarpals in the uppermost buffalo jump levels of the Kobold Site. These strata date from Late Hunter times. He suggested that these and other long bones containing significant amounts of marrow were removed to a processing area for "grease removal." The test trench at 24BH1610 contained primarily humerii, radii, ulnae, and metacarpals, many of which

had been boiled, probably to obtain tallow or grease. Also, charred bone fragments throughout the test trench closely approximated conditions at Kobold Level IV. In our opinion, test excavations at 24BH1610 may have revealed what Frison termed a processing area. This observation tends to support our conclusion that 24BH1610 was an occupation area separate from the kill site (e.g., buffalo jump, bison trap) where selected portions of carcasses were transported for detailed processing.

There is additional evidence. During Late Hunter times bison fetuses were a particularly desirable food item. They were probably very often removed from the kill site to a different area for butchering (Frison 1968:34). We found evidence of fetus bison remains at 24BH1610 which lends further credence to the suggestion that the site was a processing area apart from the kill site.

#### 24BH1611 Cut Short Site

##### Site Description

This small (approximately 100 foot square) (30.5m<sup>2</sup>) lithic scatter area was situated atop a terrace (elevation 3600 feet or 1097.3m) several hundred yards south of the North Fork of Spring Creek. There was no protection from inclement weather at this location, but the east-west view extended for several miles. Hills to the north and south restricted the view to a half mile (804.7m).

The site lay in the Lower Slope Fan/Terrace eco-zone. A baked shale surface was sparsely covered with short prairie grasses, sage and several dwarfed juniper bushes. During the spring months, potable water would have been available from nearby Spring Creek.

### Lithic Debitage

We collected only six percussion flakes from the surface, all of porcelanite. They were about the size, on the average, of a half dollar. Figure 19a illustrates a broken moss agate projectile point, also from the surface of 24BH1611. This specimen is similar in shape and size to elongated projectile points from Kobold Level III which dates (by obsidian hydration) at A.D. 316 and 582 B.C.

### Interpretations

The extremely sparse lithic scatter provides little interpretive data. This fact, coupled with the presence of a single projectile point, might suggest a lone hunting expedition around 2000 years ago where the hunter either lost or discarded a broken dart point. At any rate, exposed baked shale bedrock and the lack of soil cover would seem to exclude the possibility of subsurface cultural deposits. Thus, other cultural data that might allow more substantial interpretations are lacking at 24BH1611.



Figure 19. Artifacts: a, 24BH1611; b-c, 24BH1612; d-e, 24BH1613; f-k, 24BH1614. Actual size.

24BH1612 Panhandle SiteSite Description

Located only several hundred yards south of 24BH1611, this small (75 feet<sup>2</sup> or 22.9m<sup>2</sup>) lithic scatter area lay on a low flat midway between the forks of Spring Creek. The flat is at an elevation of 3640 feet (1109.5m) but the terrain rises sharply to the west (elevation 3795 feet or 1156.7m). There are also higher hillocks and ridges about a thousand feet (304.8m) to the north, south and east. The barren site area was sparsely covered with short prairie grasses and a few clumps of sage. Eco-zone affiliation is Creek Terrace. Water would have been available during spring runoff months from either fork of Spring Creek, each a half mile (804.7m) distant.

Lithic Debitage

We collected only twenty flakes from the entire site area, all of porcelanite. This collection represents all that we could find in a short period of time. Most (12) are of gray porcelanite and all range in size from a silver dollar to dime-sized. Nearly all display a distinct bulb of percussion.

Figure 19b illustrates a worked flake of red porcelanite. The specimen has been broken at the top and bottom. Both edges have been pressure flaked. A broken gray porcelanite biface (figure 19c) was collected as well as a broken

portion of a porcelanite side scraper (not illustrated). Each of these artifacts probably functioned as a cutting or scraping tool.

### Interpretations

The sparse lithic scatter provides meager interpretive data. The lack of temporally diagnostic artifacts does not allow the site to be placed into a broad temporal category. The utilitarian tools suggest that some type of economic activity was performed here, but there are no other data to support this speculation. The small number of flakes and sparse scatter are probably indicative of a lack of significant subsurface cultural deposits.

### 24BH1613 Saddle Site

#### Site Description

This is another of the many chipping station sites in the area. It is situated in a saddle between two small hillocks several hundred yards north of the South Fork of Spring Creek. The hillocks are at an elevation of 3620 feet (1103.4m); the saddle is perhaps ten feet (3.0m) lower at its lowest point. Short prairie grasses and sage are the only vegetation types at and near the site. The area may be considered part of the Lower Slope Fan/Terrace ecosystem.

The maximum visibility in any direction is less than

1500 feet (457.2m). There is little shelter available here. A water supply from Spring Creek would have been available during spring months only.

### Lithic Debitage

The only stone material type present here was red porcelanite. The ten half dollar sized percussion flakes are probably all from the same core. We also collected two artifacts. One (figure 19d) was a broken biface, the other (figure 19e) may have functioned as a knife. The latter specimen is broken at the lower edge.

### Interpretations

It appears that this chipping station (approximately 10 feet<sup>2</sup> or 3m<sup>2</sup>) resulted from a lone individual's knapping activities. We cannot place the site in a temporal category because of the lack of temporally diagnostic artifacts.

## 24BH1614 Porcupine Site

### Site Description

Situated in a low swale, the site area (approximately 300 feet<sup>2</sup> or 91.4m<sup>2</sup>) is sheltered from inclement weather by surrounding hillocks and small ridges. The view is limited to one-half mile (804.7m) or less in all quadrants except towards the southwest, where Spring Creek and the hills beyond are visible. Spring runoff waters have cut deep gullies

nearby that meander into an unnamed tributary of Spring Creek. These breaks and miniature canyons support stands of juniper and pine as well as provide a protective habitat for game animals. The protected swale (3580-foot elevation or 1091.2m) and the proximity to game probably made the area a desirable place to camp.

Although the actual site area is covered only by short prairie grasses, sage, several juniper and some small berry bushes, it should be considered as part of the surrounding Moist Slope Ponderosa Pine eco-zone. This ecosystem, coupled with the nearby broken terrain, provides excellent forage and shelter for game animals. The ephemeral tributaries of Spring Creek would have provided a dependable water source probably only during the spring months.

#### Surface Lithic Debitage

We collected a variety of stone material types at 24BH1614, although flakes from red (12) and gray (25) porcelanite occurred most frequently. Included in our collection were two porcelanite cores (one gray-colored, the other red), each about 8.5 by 6.5 by 3.0 centimeters in size and flakes of agate (1), white quartzite (1), black glassy slag (1), red chert (2), pink quartzite (2), and tan chert (1). Ninety percent of thisdebitage may be classified as percussion flakes. They range in size from 5.0 by 4.3 by 1.0 centimeters to about the size of a half dollar. The remainder are small (less than the size of a dime) pressure spalls.



Figure 19f depicts a broken (along the top and bottom edges) portion of a bifacially worked tool. We are not sure of the function of the tool, but it may have been used for cutting. A nearly complete corner-notched projectile point is illustrated in figure 19g. This specimen is made from a nearly translucent chalcedony. Other tools included a quartzite knife (figure 19i), a broken side scraper (figure 19j) and a broken knife (figure 19k), both of gray porcelanite. Not illustrated is a worked flaked of chalcedony.

#### Surface Faunal Remains

One small (4.0 x 2.2 x .4cm) bone fragment was recovered from the surface. It was too small for identification purposes.

#### Testing Phase

Our test trench was located at an area where we discovered several surface artifacts. We excavated the two-meter by one and one-half meter trench in arbitrary five-inch (12.8cm) levels to a total depth of twenty inches (51.3cm). All material from the test area was screened through a one-quarter inch (.64cm) mesh screen.

At twenty inches (51.3cm) we encountered an extremely hard-packed, nearly impenetrable stratum. Prior to the packed floor, the subsurface soils were loosely consolidated and undifferentiated.

The single cultural component at the site extended to a depth of 15 inches (38.5cm), although we recovered most of the cultural debris from the uppermost level (0 to 5 inches or 12.8cm). The projectile point midsection pictured in figure 19h came from a depth of five inches (12.8cm) below the surface. The specimen was made of red porcelanite. We cannot assign a time period to this partial specimen because of the lack of temporally diagnostic attributes. We also recovered from the upper level, flakes of red (11 total) and gray (13) porcelanite and one of pink quartzite. Only a few of these appear to be from pressure flaking activities and are small (less than the size of a dime). The remainder are percussion spalls ranging in size from several centimeters square to about the size of a half dollar.

The second level (5 to 10 inches or 12.8-25.6cm) yielded flakes of red (18 total) and gray (8) porcelanite and a green quartzite cobble. The cobble is oblong in shape, measuring 6.2 (length) by 4.8 width) by 2.2 centimeters thick and had been broken. It may have functioned as an abrader. The flakes are, on the average, about the size of a twenty-five cent piece. Included in our collection from the second level were two small (less than 2cm<sup>2</sup>), unidentifiable bone fragments.

We collected only five flakes from the third level (10 to 15 inches or 25.6-38.5cm), all of gray porcelanite. They were small (about one centimeter square) pressure spalls.

We did not encounter any bone or charcoal throughout the entire pit. The lowest level (15 to 20 inches or 38.5-57.3cm) did not contain cultural material.

### Interpretations

Judging from the variety of stone materials, the number (7) and variety of artifacts and the ideal location, we feel that 24BH1614 was an occupation site, perhaps in conjunction with hunting activities. The bone fragments, scrapers and knives indicate that some meat preparation was carried out at the site. It is possible that the preferred game animals hunted near the site were deer and antelope, rather than buffalo, because the nearby breaks and small canyons are an important habitat for these ungulates.

The corner-notched projectile point (figure 19g) collected from the surface of 24BH1614 is very similar to specimens found in the Late Archaic level (III) at the Kobold Site (Frison 1970:figure 12). This level yielded obsidian hydration dates of 582 B.C. (2532 B.P.) and A.D. 316 (1634 B.P.).... Also (Frison 1970:31), similar specimens found in association with materials radiocarbon dated at A.D. 110 $\pm$ 70 (1840 B.P. $\pm$ 70) were discovered at the lower levels of Old Woman's Buffalo Jump in Alberta. Based on typological similarities, the Porcupine Site might date from the early part of the Late Archaic, circa 2000 to 1500 years ago.

24BH1615 Two Point SiteSite Description

The Two Point Site was situated on three finger-like ridges that extended into an unnamed ephemeral tributary of Spring Creek. The ridges provided a good view of the creek, a half mile (804.7m) distant. Higher terrain limited the view to several hundred feet in each of the other quadrants. Montana Highway 314 cuts through a portion of the site on the eastern edge. Sage, cacti and short prairie grasses comprised the vegetation complex. The draws and breaks that lay west of the ridges support stands of ponderosa pine. These areas are favored habitats of deer and antelope. The eco-zone is probably best characterized as a Moist Slope Ponderosa Pine system.

Lithic Debitage

Our collection from 24BH1615 included only two artifacts, although we did observe a few (not more than twenty) porcelanite flakes and cores scattered about a three hundred feet by fifty feet (91.4-15.2m) rectangular area. Figure 20a illustrates a projectile point midsection found at the site. A second artifact (figure 20b) may be either a broken knife blade or a projectile point tip. Both specimens are made of gray porcelanite.

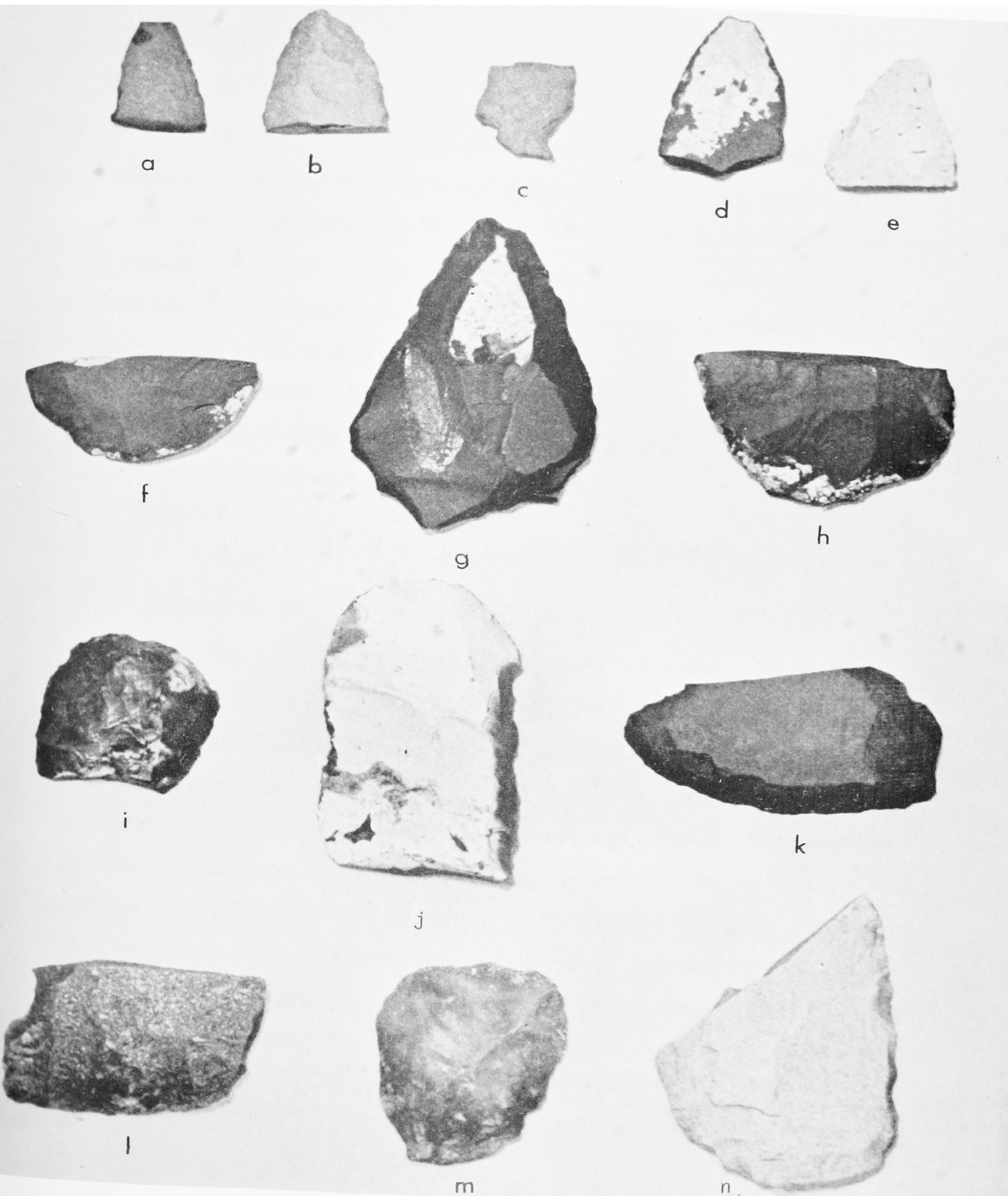


Figure 20. Artifacts: a-b, 24BH1615; c-h, 24BH1618. Actual size.

## Interpretations

Most of the area consists of exposed baked shale bedrock, thus there is little soil cover that might contain subsurface cultural deposits. The presence of at least one projectile point and a very sparse lithic scatter suggest hunting activities occurred in and around the area. The nearby gullies and breaks provide excellent shelter and habitat for game animals other than bison. The lack of temporally diagnostic artifacts prohibited us from assigning the site to a broad temporal period.

### 24BH1616 North Fork Quarry Site

#### Site Description

This quarry area was situated on two eroded points of land that extend into the North Fork of Spring Creek. The points were at an elevation of 3620 feet (1103.4m); the creek bed lay at 3600 feet (1097.3m). A sparse covering of prairie grasses, sage and cacti covered the upper portions of the small ridges. The sloping areas had been badly eroded, exposing about twenty porcelanite nodules. These specimens averaged about the size of a softball. Large (6 or 7cm<sup>2</sup>) percussion flakes occurred on the upper part of the ridges.

#### Lithic Debitage

None was collected.

## Interpretations

Apparently this quarry site saw limited use. There are no more than fifteen or twenty cores and percussion flakes within a one hundred-foot square (30.5m<sup>2</sup>) area (estimated). Only a few nodules have eroded from the slope. It is possible that suitable knapping materials from the site were quickly exhausted. At any rate, compared to other quarry areas, this site appears to be very insignificant in the pre-history of the area.

### 24BH1617 Hilltop Site

#### Site Description

Although the rock alignment at this site has been badly disturbed, it appears to have once been a medicine wheel eighteen to twenty feet (5.5-6.1m) in diameter. The wheel is situated atop the most prominent hill (elevation 3692 feet or 1207.6m) in the project area. The view from the site area is spectacular, exceeding five miles (8.1km) in all directions. The Big Horn Mountains to the south and the Tongue River Valley to the east are particularly impressive.

Many of the rocks that once comprised the structure have been removed from their original locations to support an elevation control point marker and supporting guy wires. The structure is in such a state of disrepair that it is

nearly impossible to discern relevant features. It does appear that there was once a hub with outward radiating spokes of stone. The spokes were probably enclosed by a larger, outside circle of stones. Some of the stones are embedded one-half inch (1.3cm) or more into the surface.

The stones used in construction of the wheel do not occur naturally at the summit of this hill. They were probably transported several hundred yards from a lower ridge where rock outcrops are present.

#### Lithic Debitage

We did not collect a debitage sample from the site but we did observe about ten porcelanite flakes scattered around the medicine wheel.

#### Interpretations

The function of medicine wheels is problematical. Most scholars agree that they were utilized for ceremonial purposes, but few agree on specific purposes. Origins are also hard to establish. Medicine wheels are discussed in detail in a previous section.

Small medicine wheels similar to the structure at 24BH1617 have been recorded in other areas nearby. A wheel ten to fifteen feet (3-4.6m) in diameter is located on a bluff three miles (4.8km) east of Sheridan, Wyoming. This wheel provides a spectacular view of the Big Horn Mountains



(USDI 1967:figure 18). Fredlund and Fredlund (1973:25) recorded an ethnographic account of a large rock ring with spokes on a bluff overlooking Youngs Creek. Youngs Creek is only a few miles south of the project area. There is no extant evidence of the ring according to the Fredlunds.

### 24BH1618 Confluence Flats (Figure 23b)

#### Site Description

This extensive (estimated 200 yards<sup>2</sup>) (182.9m<sup>2</sup>) occupation area occupied a terrace (elevation 3620 feet or 1103.4m) two hundred yards (182.9m) south of the North Fork of Spring Creek. The elevation of the creek bed at this point was 3590 feet (1094.7m). The terrace has been dissected by three gullies that feed an unnamed, ephemeral tributary of Spring Creek. An excellent view (several miles each direction) up and down (west-east) the creek valley was available from the terrace flat. Hills one-quarter mile south and half a mile north restricted visibility to less than a mile (1609.3km). There did not appear to be much protection from inclement weather throughout the terrace. Drinking water would have been available only during the spring runoff months.

The terrace slopes into the creek valley towards the north. The south rim of the flat is defined by a runoff gully that meanders eastward into the Spring Creek tributary. This causes the terrace to taper to a point at its eastern

edge. Much of the upper portions of the terrace were characterized by exposed chunks of friable, baked shale. The lower areas of the terrace, particularly on the south edge are characterized by (fifteen inches plus) (38.5cm) unproductive soil deposits caused by erosion of the upper terrace. Most of the lower terrace soils do not support vegetation. Sage, short prairie grasses, cacti and a juniper bush grow on the upper terrace. The vegetation complex is characteristic of the Lower Slope Fan/Terrace eco-zone.

#### Surface Lithic Debitage

Our collection included flakes and artifacts made from a variety of stone materials. Debitage occurred on both the upper and lower portions of the terrace.

#### Upper Terrace Debitage

We collected flakes of various colored quartzites (7), chalcedony (2), black glassy slag (1), and obsidian (2) from this area. The most frequently occurring material was, however, porcelanite of which we collected twenty-six flakes and two cores. One core appears to be prepared along an edge and may have been used as a chopping tool. Percussion spalls ranged from about the size of a nickel to 6.0 by 4.2 by .8 centimeters in size. There was no evidence of pressure flakes at the surface.

Figure 20d depicts one of the artifacts collected

from the upper terrace. This specimen is a projectile point midsection of gray porcelanite. Utilitarian artifacts included two side scrapers of red porcelanite (figures 20g and 20k), a broken biface of fine-grained tan quartzite (figure 20n), two chert plano-convex end scrapers (figures 20i and 20m), a broken knife of pink quartzite (figure 20-l), and a long scraper of a patinated, pink chalcedony. This last specimen is flaked along the curved edge only (figure 20j).

#### Lower Terrace Debitage

We found fewer flakes and artifacts on the lower terrace. A projectile point (figure 20c) exhibits a broken base that is similar to some corner-notched specimens. The remainder of the artifact assemblage was comprised of three broken bifaces (figures 20e, 20f, and 20h), all of porcelanite (2 red-colored, 1 gray). Otherdebitage included seven percussion spalls no larger than a twenty-five cent piece.

#### Other Finds

We collected a charred piece of wood and a charred bone fragment from the upper terrace. An examination of the cut banks near the site revealed a metacarpal and a maxilla fragment (both from B. bison) eroding from the bank. The bones were at a depth of thirty inches (76.2cm) from the

surface and may have washed down from the upper portions of the site.

### Testing Phase

Testing operations at 24BH1618 included digging three test trenches, one located on the lower terrace and two on the upper terrace. Each trench was one and one-half meters square. A one-quarter inch (.64 cm) screen was used to sift all materials excavated from each test trench. We selected areas that exhibited surface artifacts and/or other debitage for trenching operations.

Our initial test trench was excavated to a depth of ten inches (25cm) before we encountered an impenetrable stratum of baked shale. We were able to recover two charcoal pieces (not large enough for C<sub>14</sub> dating purposes), a small gray porcelanite pressure spall, a chert spall, and a quartzite flake (all less than one gram in weight). In order to determine the depth of the baked shale deposits, we dug a one-foot square (30.8cm<sup>2</sup>) pit into the center of the trench. At twenty inches (51.3cm) the digging became impossible so we discontinued our efforts. There were no cultural deposits in the last ten inches (25.6cm) at this test area.

A second test trench on the upper terrace yielded no cultural material. This pit (1.5m<sup>2</sup>) was excavated to a depth of eighteen inches (46.2cm) before being backfilled.

We also encountered numerous baked shale fragments and shale bedrock at this trench.

The trench (1.5m<sup>2</sup>) on the lower terrace (T-3) revealed a depth of sixteen inches (41.0cm) before we encountered baked shale bedrock. There were no cultural deposits beneath the surface.

### Interpretations

The large number (12) and variety of tools at this site suggest an extensive occupation of the area. A few cultural items recovered from deposits at the first trench indicate a subsurface distribution to a depth of approximately six inches (15.4cm). However, two other trenches did not reveal cultural data.

Numerous (10) utilitarian artifacts (e.g., scrapers, a chopper, bifaces, knives) indicate that hide preparation and/or butchering activities were carried out here. The presence of B. bison remains from a cut bank tends to support this suggestion.

It is difficult to precisely date 24BH1618. The presence of a charred wood fragment at the surface would suggest a relatively recent date, but the only typologically datable artifact (figure 20c) that we found at the site is probably characteristic of Late Archaic projectile points. There is a possibility that the area was used many times over a long period.

24BH1619 Terrace SiteSite Description

An impressive view of the South Fork of Spring Creek was available for the site area. The site was situated on a sandstone flat that jutted out from the upland ridges that separate the South Fork from Pearson Creek. The flat was south of the creek (Spring Creek) at an elevation of 4140 feet (1261.8m). The site area was about one hundred feet ( $30.5\text{m}^2$ ) square.

Vegetation included numerous spruce trees, a good stand of ponderosa pine, yucca, some sage, rabbit brush, and occasional clumps of short prairie grass. Most of the area exhibited an exposed, flat sandstone floor. The site can be assigned to the interface between the Scoria/Sandstone Outcrop-Dry Slope Ponderosa Pine eco-zones. Precipitous slopes would have made access to water from Spring Creek difficult.

Lithic Debitage

Although we did not collect a sample of the detritus, we observed hundreds of large (6cm long, 4cm wide, on the average) percussion flakes of gray porcelanite. Other smaller flakes varied from half to a quarter that size. We did collect a white chert projectile point from the size (figure 12a). This specimen is characteristic of projectile points usually assigned to the McKean Complex, an Early Archaic manifestation.

## Interpretations

The dense scatter of large percussion flakes suggests extensive use of the area as a workshop where flakes were prepared for later modification. Apparently, only initial stages of the toolmaking process (e.g., core reduction, flake preparation) were carried out here. The porcelanite raw materials did not occur naturally on the flat. They were probably transported several hundred yards from the slopes on the western side of this ridge. Here, porcelanite nodules occur scattered about the surface of the slope. There are also hundreds of large percussion flakes in association with the nodules.

Although it is impossible to conclusively demonstrate with the evidence we now have, the porcelanite source and the flat at 24BH1619 have probably been utilized continually for several thousand years. Based on typological associations supplied by the Early Archaic specimen, this utilization may have begun as much as four or five thousand years ago.

### 24BH1044 Boulder Spring Site (Haberman, 1973)

#### Site Description

The Boulder Spring Site is located near the head of a side canyon on the north side of the South Fork of Spring Creek at an elevation of 4060 feet (1237.5m). It is a chipping station site.

A grove of cottonwood trees seems to indicate a water source. I was told that there is a spring in this area but

did not see any flowing water during my brief stay at the site. Several modern reservoirs have been constructed in this vicinity. A series of sandstone boulders outcrop along a knoll northeast of the suspected spring location. Thinly scattered lithic debris occurred throughout this area. Depth of cultural deposits at the site was estimated to range from surface to several inches. The site lies in the Scoria/Sandstone Outcrop eco-zone.

Vegetation includes big sagebrush, prairie grasses, cottonwood along the spring course, and a few ponderosa pines around the sandstone outcroppings. Water presumably would have been available at the spring beside the site. A modern reservoir below the spring was holding water as of late July.

#### Material Collected

Four flakes of metamorphosed shale (porcelanite) and one of red jasper were found on the surface of the site. No diagnostic artifacts were collected. Jim Miner, a local rancher, reported having found several artifacts in this vicinity.

#### 24BH1045 Prairie Spring Site (Haberman, 1973)

#### Site Description

The Prairie Spring Site is located on the valley floor of the South Fork of Spring Creek just north of a low swale where a small spring emerges. The site is situated at an



elevation of 2730 feet (1133.9m) in the Creek Terrace eco-zone and is classified as an occupation site.

Scattered lithic debris covers an area of approximately 50 by 50 yards (45.7 x 45.7m). Due to the kinds of artifacts recovered and the general setting, it is felt that the site was used as an occupation area. An opening between the ridges to the north of the site permits easy access into the Spring Creek Valley. The view from the site is restricted by ridges to the north and south of the site which define the South Fork of Spring Creek Valley. The valley floor is about one mile wide in the vicinity of the site.

The site is located beside a small spring which was still flowing slightly in late July, the recording date for the site. There are a few dead deciduous trees standing in the area. Scattered cottonwood trees grow at other points along the stream. Present vegetation on the site includes big sagebrush, various prairie grasses, and forb species. Sedge grows in the moist swale near the spring.

#### Material Collected

Artifacts found on the surface of the Prairie Spring Site include the base of what seems to have been a corner-notched projectile point of gray metamorphosed shale (porcelanite), a brown chert end scraper, a broken side scraper of rose colored agate, and a broken knife of red metamorphosed shale (porcelanite). Three bifacially worked fragments of

gray metamorphosed shale (porcelanite), a small biface of black flint, and a thin midsection of a red metamorphosed shale (porcelanite) tool were also recovered.

Lithic materials scattered over the surface of the site were predominantly of gray and red metamorphosed shale (porcelanite). Limited material of other types included two flakes of agate and one of pink chert. Jim Miner, a local rancher, reported having found several end scrapers in this vicinity.

#### Additional Surface Material, 1976 Survey

Prior to commencing test excavations at 24BH1045, we conducted a resurvey of the surface area. We found an additional eight artifacts and two bone fragments. One bone fragment was identified as a tarsal (B. bison); the other was too small for identification.

Figure 21a depicts a preform of gray-colored porcelanite from the surface of 24BH1045. Other artifacts in our collection included three broken bifaces (figures 21b, 21c, and 21d) and a porcelanite knife fragment (figure 21e). These tools were probably used for cutting and scraping. We also collected a worked flake (figure 21g) of red chert.

Haberman suggested, on the basis of projectile point typology, that this site did not seem to conform to the general settlement pattern in the area as he interpreted it. Two more basal fragments from corner-notched projectile points

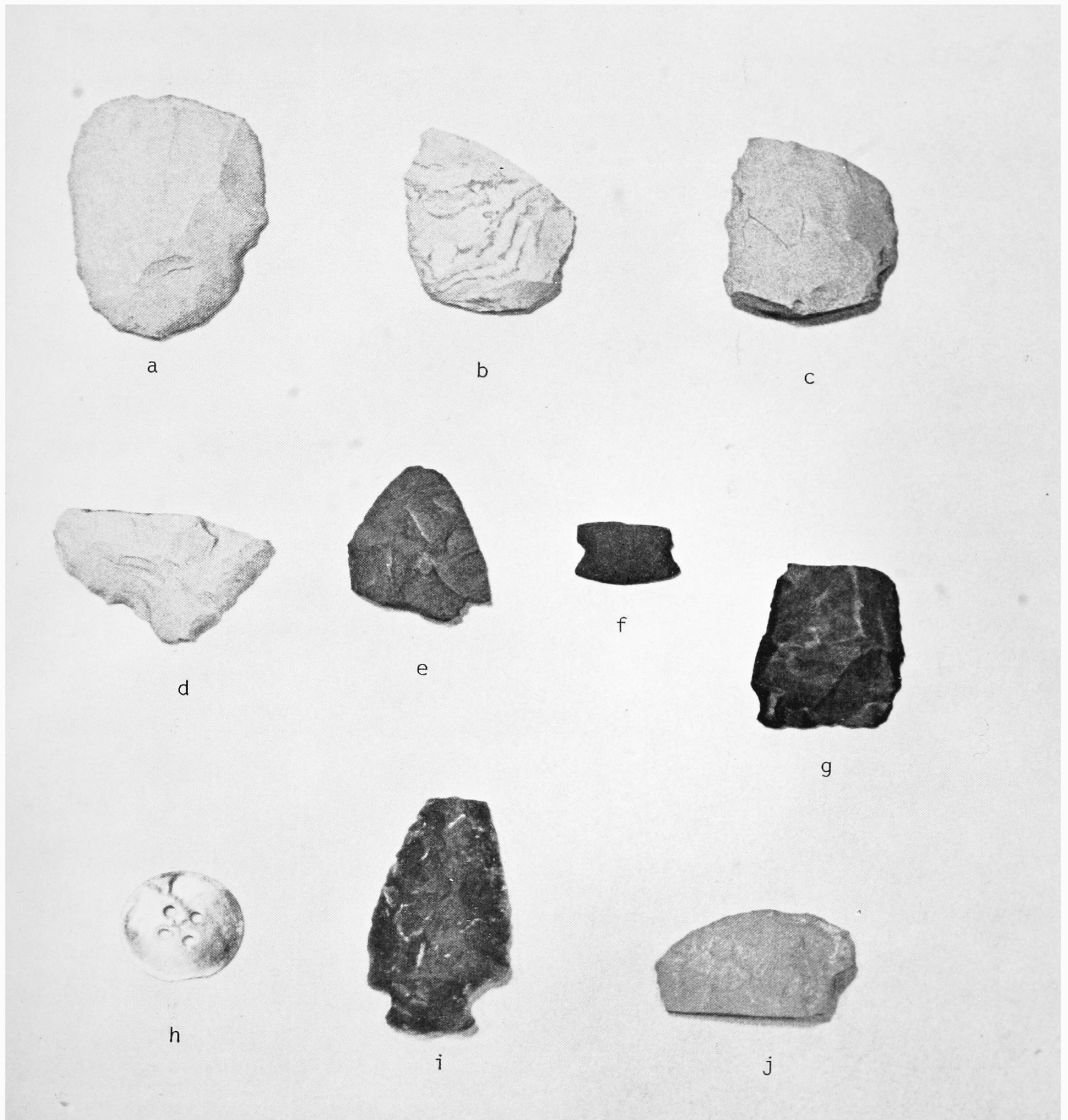


Figure 21. Artifacts: a-h, 24BH1045; i-j, 24BH1046. Actual size.

that we collected from the surface would tend to confirm Haberman's suspicions. Although the base is partially broken on one point (not illustrated), the specimen seems to be similar to points recovered from Kobold Level III (Frison 1970:figure 12), particularly figure 12x. A second specimen (figure 21f) is nearly identical in size and shape to a projectile point base illustrated by Frison (1970:figure 12g), also from Kobold Level III. This level was dated by the obsidian hydration technique at circa 582 B.C. to A.D. 316. If similar points at 24BH1045 have a comparable antiquity, then the site probably dates from the Late Archaic Period.

Additional surface detritus included flakes of gray porcelanite, tan chert, chalcedony, and red quartzite. These items ranged from half the size of a dime to about the size of a quarter. We also picked up unidentifiable tooth fragments (enamel only) from the surface. These averaged one centimeter long and a half centimeter wide.

Figure 21h depicts a shell button found at the site. Buttons of this type were made from the late 1800s through about 1910. There are also remnants of a junked car at the site. The button and auto body are probably both from recent white activities, although the button might be associated with historic Native Americans in the area.

### Testing Phase

We noticed small ( $.3\text{cm}^2$  to  $.7\text{cm}^2$ , average) pressure flakes of gray and red porcelanite scattered among the many

pebbles on an ant hill. Proceeding on an assumption that many of these spalls had been brought up by ants from below the surface, we elected to place our test trench around the ant hill. A one and one-half meter square trench was excavated in two arbitrary five-inch (12.8cm) levels to a depth of ten inches (25.6cm). The earth was sifted through a one-quarter inch (.64cm) screen. We did not discover cultural debris in the bottom level, but in the top level (0 to 5 inches or 0-12.8cm) we recovered about seventy-five small (.5cm<sup>2</sup> to 3cm<sup>2</sup>) pressure spalls from gray and red-colored porcelanite. From the evidence in our test pit, it seemed to us that the cultural deposits at this site extended to a depth of five inches (12.8cm) below the surface. It also seems likely that extensive pressure flaking and retouch activities were carried out here.

### Interpretations

Based upon known dates for particular artifact types, this Creek Terrace site probably dates from the Late Archaic Period. Such an interpretation would not conform to Haberman's (1973) settlement pattern hypothesis.

Judging from the presence of utilitarian artifacts and bison remains at the site, we think that it probably functioned as a hide or meat preparation area. Haberman's site description mentioned the presence of a seasonal (spring months) spring only a few hundred feet from the site area. This would indicate that the site was used during the spring

months, perhaps to prepare summer supplies. However, springs of this type, while they are not active most of the year, can often supply water the year around. This is accomplished by digging basin-shaped holes into the ground near the spring which allows potable water to seep gradually into the basin and accumulate there.

The small pressure flakes indicate that a great deal of tool sharpening occurred at the site. This phenomenon is often associated with hide and meat preparation when dull tools must often be sharpened.

#### 24BH1046 Spring Creek Petroglyph Site

(Figure 22) (Haberman, 1973)

#### Site Description

The Spring Creek Petroglyph Site is located at a sandstone outcropping along the South Fork of Spring Creek. The south facing sandstone face is visible from the ranch road through the South Fork of Spring Creek Valley. The site lies about one-quarter mile (.4km) north of the present stream course. The area of the site is approximately one-fourth by one-eighth mile (.4km x .2km).

Petroglyph motifs include one panel depicting a horse and a tipi that is in excellent condition due to its protected location under a small overhang. The horse may be pulling a travois (figure 23). There are a few badly weathered carvings on the sandstone outcroppings in more exposed locations.





Figure 22. Sandstone Cliffs at 24BH1046.





Figure 23. Horse and Other Petroglyphs, 24BH1046.



These include a panel with what seems to be portions of three shield-bearing warriors, only one of which is at all well preserved (figure 24). The rock art at this site also portrays a horned mammal (figure 24). Plastic overlay copies were made of all aboriginal carvings. Occasionally, stray lines are detectable; making it seem likely that there once were more petroglyphs at this location but that they have now been weathered beyond recognition.

On high points along the ridge to the east and west of the petroglyph panels, concentrations of lithic debris occur. These seem to be "lookout" locations, but of course are not necessarily contemporaneous with the rock art site. No lithic material was found in the immediate vicinity of the petroglyph panels.

Big sagebrush, prairie grasses, prairie forbs, and some juniper bushes on nearby slopes compose the present vegetation in the vicinity of the site. Water is available along the South Fork of Spring Creek about one-fourth mile (.4km) south of the site.

#### Material Collected

Stone tools found on the high knoll east of the petroglyphs include a large gray quartzite knife, two bifacially worked pieces of gray metamorphosed shale (porcelanite), and a retouched flake of reddish chert. Flakes from along the ridge east and west of the petroglyph panels were mostly

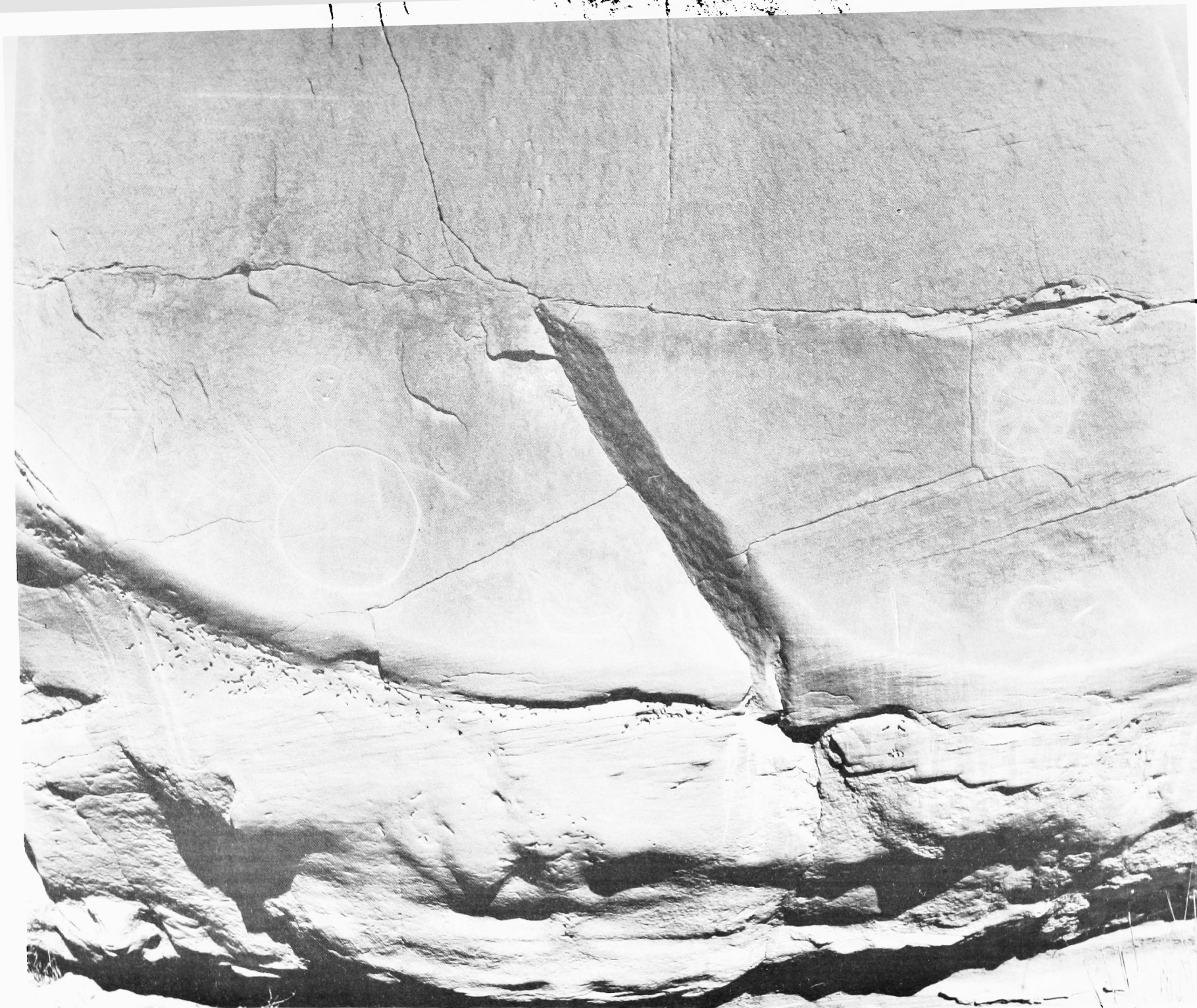


Figure 24. Petroglyphs at 24BH1046.

percussion flakes of gray metamorphosed shale (porcelanite). A few flakes of dark metamorphosed shale (porcelanite) were also present. It seems likely that metamorphosed shale (porcelanite) occurs naturally along this ridge and that the areas where flake concentrations were noted indicate locations where limited quarrying and rough stone working activities were carried out.

#### Additional Finds, 1976 Survey

Our resurvey of the sandstone cliffs and the areas above and below the petroglyph panels resulted in the discovery of additional petroglyphs, a Late Archaic dart point (figure 21i), a concentration of pressure spalls and fossil turtle shell fragments (species unknown). The shell fragments have eroded from the sandstone cliffs (Thom et al. 1935:59, 61).

The petroglyphs depicted in figure 24 were incised into the sandstone face illustrated in figure 22 that is slightly left of center. The horse petroglyph (figure 23) was located among the sandstone blocks at the extreme right of figure 24. Additional petroglyphs not recorded by Haberman included a set of two parallel incised lines of unknown purpose, a round face complete with eyes, nose, mouth, and enlarged triangular ears and other unidentifiable markings. None of these are illustrated in this report, but they are located on the large sandstone face left of center (figure 24).

Another feature that we discovered was a six centimeter in diameter hole bored into a vertical sandstone face.

Apparently the hole was not formed by natural processes because it is nearly perfectly circular and extends into the face for nearly thirty centimeters. This feature is located about six feet (.6m) above ground level near the set of parallel incised lines mentioned earlier. We can offer no speculation regarding the origin and/or function of this phenomenon.

Above the petrogrlyph panels on the cuesta rim we discovered an ant hill with small ( $.3\text{cm}^2$  to  $.7\text{cm}^2$ ) pressure spalls of porcelanite scattered about the surface. We did not test here, but it was similar to the situation that occurred at 24BH1045 where small retouch flakes were recovered to a depth of five inches (12.8cm).

Figure 21i illustrates the projectile point from 24BH1046. The specimen is similar to a wide range of dart points from Kobold Level III (Frison 1970:figure 12). The Kobold specimens were dated by the obsidian hydration method at 582 B.D. to A.D. 316. On the basis of typological comparison, the specimen from 24BH1046 dates from the Late Archaic, probably from after the beginning of the Christian era.

### Testing Phase

We dug two test trenches at 24BH1046, one at the base of the petroglyphs illustrated in figure 24 and another below the horse petroglyph shown in figure 23. All earth in the trenches was screened through a one-quarter inch (.64cm) screen.

Test trench #1 was rectangular in shape (3m x 1m); the longer axis was oriented parallel to the sandstone face. Figure 23c depicts T-1 in relation to the sandstone. Note also the irregular-shaped hole in the floor of the test pit. This hole, apparently from a relic hunter's activities, had been filled in and was not visible at the surface. After we started trenching, however, the pit was discovered and the loose fill inside removed.

We excavated T-1 in arbitrary five-inch (12.8cm) levels to a depth of twenty-five inches (64.1cm), encountering only one stratum of hard-packed sand. At five inches (12.8cm) below the surface we collected a dime-sized porcelanite flake. We recovered a chert flake and another porcelanite flake from fifteen and twenty-four inches (38.5, 61.5cm) respectively. The only artifact from the trench is illustrated in figure 21j. This is a broken biface of gray porcelanite that may have been used for incising petroglyphs. It was discovered at a depth of fifteen inches (38.5cm). At twenty-five inches (64.1cm), we encountered a nearly impenetrable layer of sand so we elected to backfill at this point.

Starting at fourteen inches (35.9cm) below the surface, we began to encounter flecks of charcoal throughout the entire trench. The charcoal extended to a depth of twenty-five inches (64.1cm). A sample sufficient for radiocarbon dating purposes was collected. This sample yielded a date of  $1430 \pm 130$  years B.P. (A.D.  $520 \pm 130$ ). As Mulloy art panels

cannot be correlated with certainty to the rock art. However, the broken biface was discovered at about the same level that we began to encounter charcoal, raising the possibility that the artifact dates from around 1430 years ago. If the artifact was used for incising petroglyphs (there is no way to demonstrate this, however), then some of the rock art may date at circa A.D. 520. Of course, the horse petroglyph dates from after the introduction of the horse onto the Northwestern Plains (circa A.D. 1730).

A sandstone overhang near the horse petroglyph may have functioned as a rockshelter at one time. We began a one meter square trench below the horse figure and under the sandstone overhang. The loose sandy sediments prohibited vertical and horizontal control, but we did recover a cancellous bone fragment (probably a tibia from *B. bison*), and three small portions of rodent crania (species unknown). These finds came from the first six inches (15.4cm) below the surface. We excavated to a depth of twenty inches (51.3cm) before backfilling. . No cultural items were recovered from the last fourteen inches (35.9cm).

Several bones found eroding from a cut bank at the rock art panels were removed to the laboratory. These remains (cranium and several long bones) were identified as Bos sp.

### Interpretations

Comparison of a projectile point from 24BH1046 to similar specimens dated at circa A.D. 300, suggest that the site

was utilized as early as the Late Archaic Period. A radio-carbon date from a charcoal sample ( $1430 \pm 130$  B.P.) tends to confirm the validity of the typological association. Some of the rock art panels may have been completed in the Late Archaic, however, this association is very tenuous. The horse petroglyph dates from circa A.D. 1730 or after.

Lithic debitage concentrated in several areas at the site indicate a multiple use of the general area. Some tool sharpening and manufacturing may have occurred on the sandstone ridge above the art panels and on the knoll east of the sandstone cliffs. Also, a rock overhang may have functioned as a temporary shelter.

Flakes, an artifact and charcoal discovered below the surface at the base of one rock art panel indicate a subsurface distribution of cultural materials to a depth of at least twenty-five inches (64.1cm). It is probable that more data remains concealed at the base of the petroglyph panel.

#### 24BH1051 Two Valley Overlook (Haberman, 1973)

##### Site Description

Located on a high point with a good view of the surrounding country, the Two Valley Overlook Site seems to be a "lookout station." From an elevation of 3800 feet (1158.2m), the site commands an excellent view to the north and west of the Spring Creek and South Fork of Spring Creek valleys. It is situated on the western end of a high ridge and there is a

break in topography so that just to the east there is an easy pass between the two previously mentioned drainages. It is in the Upland Prairie eco-zone and is classified as a chipping station.

Cultural evidence at the site consisted of thinly scattered lithic debris covering an area of about 10 by 20 yards (9.1 x 18.3m). Pressure retouch flakes as well as percussion flakes were present on the surface. In its exposed location, most of the site seems to be surface but some material may be slightly subsurface.

Water is not available in the immediate vicinity. Apparently, the nearest water source is the South Fork of Spring Creek about one-half mile (.8km) to the south. Big sagebrush and prairie bunch grasses are the most common types of vegetation present on the site.

#### Material Collected

No diagnostic artifacts were found at the site. Stone flakes and cores present were predominantly of red and dark colored metamorphosed shale (porcelanite) and some gray metamorphosed shale (porcelanite).

24BH1052 South Fork Bottom Site (Haberman, 1973)

#### Site Description

The South Fork Bottom Site is located in the South Fork of Spring Creek Valley. Situated on a gradually sloping



terrace of the north side of the stream, the site lies at an elevation of 3640 feet (1109.5m). The occupation site is in the Creek Terrace system.

A fairly heavy scattering of lithic debris covers an area of approximately 75 by 30 yards (68.5 x 27.4m). Due to the tool types recovered, percussion and retouch flakes, and bone fragments, I feel the site represents an area of occupation. Several small stone rings approximately three feet (.9m) in diameter and composed of five or six stones per circle were perhaps fire hearths. However, in a butchering area at one of the Piney Creek Sites (48J0312), Wyoming, Frison (1967) found fourteen features which seem to be similar to these at the South Fork Bottom Site and suggested a different possibility as to their use. At Piney Creek the features are described as small stone circles, of some seven to twelve stones each, and two and one-half to three feet (.8 to .9m) in outside diameter (Frison 1967). Excavation at the site revealed that these were not fire hearths. Frison (1967:13) suggested that the small stone circles were rims for hide receptacles used in stone boiling broken-up bone to obtain grease. At the South Fork Bottom Site, small fragments of well weathered bone were in evidence at several locations on the site which suggest that it may be possible to extend Frison's interpretation to the similar features at this site. Also adding to the potential for comparability of the South Fork Bottom Site to the butchering area at Piney Creek is the number of large quartzite

and metamorphosed shale (porcelanite) knives or choppers found on the surface of the South Fork Bottom Site. Most of these tools are broken and it seems likely that tools of this size may have had their primary function in the butchering of large game animals such as bison. On the other hand, no evidence for a large-scale bison kill was recorded in the vicinity of the South Fork Bottom Site other than possibly the Old Buffalo Site (24BH1050). However, the possible triangular, unnotched projectile points found at the site may indicate a rather late occupation date in which case bison may have been pursued and shot on the valley plains from horseback.

I saw no special attraction to this location as a camp-site. Water may have been available along the South Fork of Spring Creek within a few yards of the site. In early August 1972, the stream course was dry south of the site but was "live" a few hundred yards upstream. Present vegetation includes big sagebrush, prairie grasses and forbs. Horse graze is available in the stream valley around the site. Higher ridges to the north and south of the site limit the view from this location. Depth of the cultural material at the site was estimated at from surface to several inches. The artifacts recovered suggest a two component site with both components appearing on the surface.

#### Material Collected

A wide variety of artifacts and material types were present at the South Fork Bottom Site. Projectile points from

the site included four portions of what may be small triangular points of gray metamorphosed shale (porcelanite), and the bases of two larger corner-notched points of red metamorphosed shale (porcelanite). If these are, in fact, all projectile points, the variation suggests a two component site. Scrapers included a small end scraper of red jasper and a large end scraper of brown quartzite. A large, well-made, half-moon shaped knife of gray metamorphosed shale (porcelanite) and portions of two other knives of the same material were found on the surface. Two spokeshaves of gray metamorphosed shale (porcelanite) were collected. Fragments of eight large, bifacially worked quartzite tools were found and some twelve similar fragments of bifacially worked metamorphosed shale (porcelanite). Two midsections of smaller tools, a tip fragment, and retouched flakes are also included in the stone tool industry known from the site. Several bone fragments were collected.

I believe it was to this site that Jim Miner referred in reporting that he had found stone artifacts in the vicinity and, that when constructing a small reservoir at the western edge of the site, a fire hearth was exposed.

The variety of material types represented in the flake sample includes gray, red, and dark metamorphosed shale (porcelanite); variously colored quartzites from tan and brown to purple and grayish white; agatized wood; brown and rose colored agate; red and gray igneous material; red jasper; and chert.

Metamorphosed shale (porcelanite) predominates in terms of frequency.

#### Additional Surface Finds, 1976 Survey

Haberman's 1972 survey of the South Fork Bottom Site resulted in the recovery of seventeen artifacts of various types, including projectile points, scrapers, knives, bifaces, and choppers. Our resurvey was nearly as productive in terms of artifacts collected. The thirteen artifacts illustrated in figure 25 were all collected from the site's surface prior to our testing phase. Two other artifacts are not illustrated. This makes a total of thirty-two artifacts collected from this creek terrace site.

Figures 25a, b, c, e, g, h, i, j, k, and m are all cutting tools or scrapers made from various colored quartzites. Some are broken (c, e, g, h, i, j, k) while others (a, b) are complete. Figure 25b depicts a basalt river cobble that exhibits wear patterns along the lower edge. This specimen probably functioned as a smoother or hide softener. Artifacts from the projectile point assemblage (figures 25d and 25f) are of gray porcelanite. Figures 25d and 25f represent un-notched, triangular projectile points of a type usually assigned to the later stages of the Late Hunter Period. They may also be interpreted as projectile point blanks from which side-notched specimens were fashioned.

Other surface finds included the distal epiphysis of

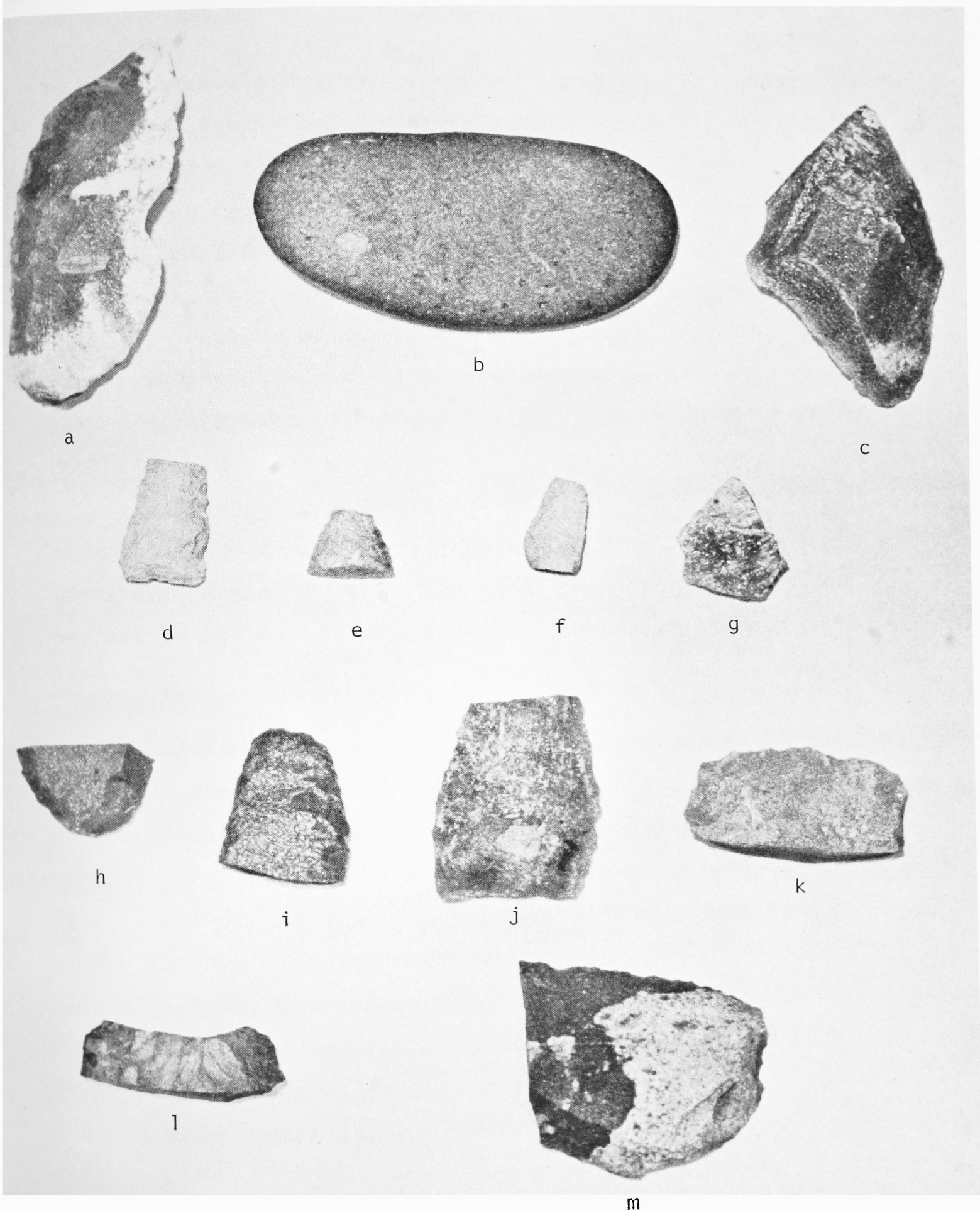


Figure 25. Artifacts: All from 24BH1052. Actual size.

an ulna from a pronghorn antelope (Antilocapra americana), several unidentifiable bone fragments and tooth enamel fragments (about .5cm long). We also recovered a wide range of stone types from the site. These included flakes of at least six different shades of quartzite, porcelanite, red glassy slag, chalcedony, and chert. Judging from fracture scars along one edge, a small (6.6 x 5.0 x 2.0cm in size) porcelanite core probably served as a chopping instrument. We also collected a broken plano-complex end scraper of purple chalcedony (not illustrated).

Although we did not collect any, we noticed thousands of small (less than .5cm<sup>2</sup>) pressure flakes at the surface of 24BH1052. These probably resulted from tool sharpening activities and are mainly from quartzite materials.

### Testing Phase

Haberman suggested that the subsurface distribution of cultural materials at the site probably did not exceed several inches. Our test excavations confirmed this suspicion. We excavated three test trenches at various locations. All of the material from each of the trenches was sifted through a one-quarter inch (.64cm) mesh screen. Each test trench was one and one-half meters square.

We located a trench in an area where we found pieces of split bone, enamel fragments and a projectile point. The pit reached a total depth of ten inches (25.6cm). Only ten

small (less than  $.5\text{cm}^2$ ) pressure spalls were recovered from the trench and these came from the first three inches (7.7cm); the last seven inches (17.9cm) were sterile. We did encounter wild onions here and these plants seem to be quite common to the terrace. Perhaps they were a food item that was exploited by the area's inhabitants. The trench reached a depth of ten inches (25.6cm) but produced no cultural data below three inches (7.7cm).

### Interpretations

Based on typological evidence from projectile points, this site was utilized during the Late Hunter Period, probably in the later stages. The presence of two corner-notched specimens (discovered by Haberman) suggests an earlier occupation, perhaps transitional from Late Archaic Period to the Late Hunter Era.

The large numbers (30) and variety of utilitarian tools (e.g., scrapers, knives, etc.) is fairly conclusive evidence that specific activities at the site included hide and/or meat preparation. Haberman suggested that this economy focused on bison butchering although there was no evidence of a bison kill site at or near the site. An antelope bone discovered at the site suggests that bison may not have been the principal animal butchered here. At any rate, the large artifact assemblage, coupled with the scanty faunal remains, might suggest the primary activities here centered around the final

stages of meat and/or hide preparation. Activities in the initial butchering stages would probably have resulted in more bone waste.

The evidence regarding Haberman's interpretations of stone alignments as fire hearths or hide receptacles remains inconclusive. These types of features might be expected given the apparent function of the site, however our excavations did not confirm Haberman's interpretation. It is entirely possible that we did not test at a feature previously identified by Haberman.

#### 24BH1058 Few Pines Site

##### Site Description

The Few Pines Site is located in a shallow recess on the first terrace along the south side of Spring Creek. The site area is protected by a higher terrace in back, and on two sides by higher portions of the same terrace on which the site rests. It is located about five miles (8km) northwest of the juncture of Spring Creek and the South Fork of Spring Creek.

In the site area, there was scattered surface lithic debris in eroded areas and rodent workings. The area of the site was estimated at 40 by 30 yards (36.6 x 27.4m). From surface indications, it appeared that the site extends to a depth of about one foot (.3m) in undisturbed areas. Two small



pieces of weathered bone that may relate to the occupation of the site were noted. Both percussion and retouch flakes were present at the site.

From the site location there is a good view of the adjacent Spring Creek Valley but visual surveillance is limited in other directions. Access to the South Fork of Spring Creek Valley is easily available from this site. As of mid-August, Spring Creek was dry in the vicinity of the site. Ponderosa pines grow along the ridge terrace just behind the site which, if present in the past, would have offered a source fuel. Vegetation at the Few Pines Site includes big sagebrush, snakeweed, prairie grasses, yucca, skunkbush sumac, juniper, and ponderosa pine. It is in the Creek Terrace zone.

#### Material Collected

A corner-notched, indented base projectile point of red metamorphosed shale (porcelanite) seemed disproportionately thick and the base unusually large for its size, indicating that perhaps the blade area had been reworked. The characteristics of the base of this artifact seemed to be most reminiscent of the Duncan/Hanna types which may be assigned to Mulloy's Early Middle Prehistoric Period (Early Archaic) for the Northwestern Plains. A small knife of pink to white chert, a large knife base of gray metamorphosed shale (porcelanite), and a large, thick knife base of red metamorphosed shale (porcelanite) were

found on the surface of the site. The midsection of a small bifacially worked quartzite tool and a fragment of a cream-colored chert tool were also recovered. Material types represented by flakes on the site included gray and red metamorphosed shale (porcelanite), some gray igneous material, and one flake which may be basalt.

### 24BH1059 Carbone Quarry

#### Site Description

Rico Carbone, a local rancher, directed me to this site. His son Jerry, a member of the Sheridan Chapter of the Wyoming Archaeological Society, originally located the site. It is situated near the highest point along the ridge overlooking the Spring Creek Valley south of the Carbone ranch. The reddish color just below the canyon rim along which the site is located is visible from the Spring Creek Valley, a considerable distance away. Such color clues often indicate areas of metamorphosed shale (porcelanite) outcroppings and may have aided prehistoric occupants in their search for materials from which to fashion stone tools.

This small site, about 15 by 15 yards (13.7 x 13.7m), featured an extreme concentration of percussion flakes and cores of red and gray metamorphosed shale (porcelanite). The site appeared to be a small quarrying area where percussion techniques were used to strike off suitable flakes from pieces of naturally occurring metamorphosed shale (porcelanite).

Large flakes or blanks were probably taken elsewhere for the completion of tool manufacture as no small pressure flakes were observed on the site. There was a shallow scrape on the hillside just below the canyon rim which may indicate an area where an attempt was made to expose subsurface stone (Jerry Carbone is to be credited with this observation). Compared to other known metamorphosed shale (porcelanite) quarries in the Decker area, the Carbone Quarry was a site of only limited quarrying activity.

Flora in the vicinity of the site included thinly scattered ponderosa pine and juniper bushes on nearby slopes. Yucca, skunkbush sumac, big sagebrush, and bluebunch wheatgrass characterize the ridge flat south of the site. Water is not available in the immediate vicinity.

#### Material Collected

A small sample of flakes and cores was collected from the surface at the Carbone Quarry. The naturally occurring material type at this site is metamorphosed shale (porcelanite) ranging in color from gray through red. One flake of agate was the only non-local material noted at the site. No tools were found.

## CHAPTER VI

### COMPOSITE ANALYSIS OF ECO-ZONAL AND TEMPORAL RELATIONSHIPS

#### Occupation Sites

##### Big Game Hunter Period

No occupation sites that could be assigned to this early prehistoric period were discovered in either our 1976 survey or Haberman's 1972 survey. However, we do know that Big Game Hunter populations did utilize the Decker area. The earliest known evidence is from the Plano Complex. Fredlund and Fredlund (1975:13) discovered several Plano projectile point types in their excavations at Benson's Butte (24BH1726) only several miles southwest of the project area. Here, fragments of Eden, Brown's Valley and Frederick point types were recovered from lower levels. The Fredlunds (1975:4) assigned the Benson's Butte occupation site to an ecotone between their ponderosa pine-savannah and short grass prairie communities. This system appears to be analogous to the Dry Slope Ponderosa Pine eco-zone.

Other Plano Complex evidence comes from two isolated finds. Fredlund (personal communication, 1976) found what he designates as a Hell Gap point near Squirrel Creek just south of the project area. Also, an Eden specimen was recovered from a dry wash near Decker, Montana (Fredlund 1972:17).

Although in the future older occupation data may be discovered in the Decker area, I suggest that the earliest human use of the area was during late Big Game Hunter times. Based on the presence of Hell Gap, Eden, Frederick, and Brown's Valley specimens which date from late in the period, and the radiocarbon dates from the Hell Gap Site (see chapter 3), it seems likely that peoples were in the area at least six or seven thousand years ago. Furthermore, it appears that, at least initially, the area was not occupied permanently or with regularity, rather it was utilized only sporadically by small populations. Since 1972, seven separate archaeological surveys (D. Fredlund 1972; Loendorf et al. 1972; Haberman 1973; Fredlund and Fredlund 1973; L. Fredlund 1975; Gregg 1977; and Fox 1977) have been conducted in or near the project area. These investigators have recovered only a handful of data representative of the Plano Complex and none from earlier in the Big Game Hunter Period. These data are quite meager when compared with the archaeological evidence representing Archaic and Late Hunter times from the same surveys.

What evidence that is available suggests that during the late Big Game Hunter era, the preferred zones of occupation and exploitation were in the uplands of the Decker area. Beckes (1976:7) noted a similar temporal/eco-zonal regularity in sites found during his investigations near Ashland, Montana. Benson's Butte (Fredlund and Fredlund 1975) is situated well above neighboring creek and terrace eco-zones at

an elevation of approximately 4250 feet MSL (1295.4m). Both Beckes (1976:7) and Fredlund and Fredlund (1975:5-6) suggested that big game hunters probably were attracted to bison herds of the upland prairies and other game ungulates of the upland breaks and draws (e.g., Scoria/Sandstone Outcrop, Dry Slope Ponderosa Pine eco-zones). Thus, their economic activities were generally restricted to the upland zones.

In lieu of additional archaeological evidence then, it seems reasonable to hypothesize a land utilization pattern in the Decker area that began during the late Big Game Hunter Period, perhaps six or seven thousand years ago. This pattern included small populations of nomadic big game hunters that apparently preferred the upland eco-zones where game animals were most plentiful and easily acquired. The scant evidence indicates that the earliest exploitation of the Decker area was infrequent and sporadic.

Hypotheses regarding functional/eco-zonal associations during this early time period are difficult to formulate. Apparently resources in the Decker area did not figure prominently in seasonal cycles of the early big game hunters. The most satisfying evidence of resource exploitation involves lithic procurement activities. Nearly all of the projectile point specimens from the late Big Game Hunter Period are made of red porcelanite. This seems to be the only prehistoric period (with perhaps the Early Archaic as an exception) where

red porcelanite was frequently used and even preferred. There are several red porcelanite quarries in the Decker area (Haberman 1973).

If Loendorf's (1970) seasonal transhumant model can be applied to the project and surrounding area, perhaps the lithic procurement activities were planned to coincide with late summer and fall bison procurement excursions. Loendorf felt that early human populations followed bison from their summer mountain ranges into the lowlands where fall hunts designed to secure food stores for the impending winter were carried out. If so, the Decker area was not frequented regularly in this transhumant cycle. Considering that Loendorf demonstrated a cycle for the nearby Pryor Mountains, it is logical to assume that a similar seasonal cycle might have involved the Decker area and the adjacent Big Horn Mountain Range.

Evidence at Benson's Butte suggests that the infrequent use of the Decker area may have been confined primarily to the late summer months (Fredlund and Fredlund 1975). However, precise seasonal movements remain obscured for the present.

### Early Archaic Period

To date only two Early Archaic occupation sites have been identified in the project area, each of which was located in a differing eco-zone. The Early Archaic component

at 24BH1058 occurred in the ecotone between the Scoria/Sandstone Outcrop and Dry Slope Ponderosa Pine eco-zones.

Evidence from a Lower Slope Fan/Terrace site, 24BH1610, indicates that the site has been utilized occasionally since the Early Archaic. Here I found a McKean continuum projectile point (Duncan) and a side-notched specimen characteristic of the Late Hunter Period. However, the preponderance of data (e.g., radiocarbon dates) suggest that the site area was heavily utilized only during Late Hunter times. Other than the Duncan specimen, there is no other surface data typologically representative of the Early Archaic. Our test excavations revealed a similar situation below the surface. Moreover, the Duncan point was discovered just at the eastern edge of the lower slope terrace among a few ponderosa pine and above a tributary of Spring Creek. The tributary has cut a miniature canyon reminiscent of the larger upland breaks and draws. Perhaps the Early Archaic specimen's occurrence resulted from a lone hunter exploiting the lower slope breaks for deer or antelope. While additional data from earlier prehistoric periods may be retrieved in the future, I suggest that 24BH1610 be classified primarily as a Late Hunter Period occupation site.

Other Early Archaic evidence of occupation sites comes from sites situated near the project area, Benson's Butte (24BH1726) and the Kobold Site (24BH1406). At Benson's



Butte both earlier and later McKean complex point styles were prevalent (Fredlund and Fredlund 1975:15). As noted earlier, Benson's Butte is a multi-component upland occupation site situated in the Dry Slope Ponderosa Pine eco-zone.

At the Kobold Site, a bison jump north of the project area, four distinct occupation levels were recognized (Frison 1970:1 35). Level II of the occupation area associated with the jump contained specimens that fell within the range of variation for McKean points. Level III contained some later McKean specimens. This site is located in the Scoria/Sandstone Outcrop eco-zone.

Evidence from these four sites, and the lack of Early Archaic data from the lowland eco-zones, indicate a continuing trend (from the late Big Game Hunter Period) in the Decker area of upland eco-zone exploitation. This occupation appears to have occurred primarily in the Scoria/Sandstone Outcrop and Ponderosa Pine (Dry and Moist) eco-zones. There is, however, a noticeable lack of known Early Archaic occupation sites from the Upland Prairie eco-zone. This observation is inconsistent with the Early Archaic subsistence base in the Decker area, that of big game hunting, particularly in light of the fact that preceding big game hunters (late Big Game Hunter Period) exploited the Upland Prairie zone. It is therefore likely that this absence reflects inadequacies in sampling that plague surveys of this type. This seems to be a problem that can only be

solved by future investigations.

During the initial stages of the Early Archaic (ca. 5000 B.C.-ca. 3000 B.C.), the Northern Plains experienced vast increases in the area of short grass prairie while the forage yield remained generally the same as in previous times (Reeves 1973:1228). These factors contributed to the maintenance of large and stable bison populations from which Northern Plains and Decker area hunters derived their subsistence. Beginning circa five thousand years ago and lasting until circa 750 B.C., minor fluctuations in climatic conditions caused a trend towards reduction in short grass prairie area on the Northern Plains (Reeves 1973:1222, 1231). While the Plains were not reduced to hot, arid, inhospitable lands incapable of supporting bison and human populations as some earlier concepts (e.g., the Plains Altithermal) proposed, apparently a decrease in quality and extent of range grasses thinned bison populations somewhat. It seems likely that these concomitant changes in range conditions and bison populations did not substantially affect the Decker area, at least not initially. Evidence from the latter stages of the Early Archaic component at the Kobold Site (about the time of Reeves' proposed environmental changes) indicates that bison were present in the Upland Prairie eco-zone in numbers sufficient for dependable exploitation. However, this condition did not persist in the Decker area, for stability in environmental conditions and bison populations seem to have

deteriorated during the transition from the Early into the Late Archaic. In the Decker area, human populations did not begin to respond to these episodic fluctuations until sometime in Late Archaic times. Late Archaic human adaptations are discussed in detail in a later section.

The big game hunting economy of the Early Archaic, then, seems to have been preferentially confined to the upland eco-zones throughout the entire period. It is likely that these preferences reflected a continuing recognition of the abundant upland game resources that were not immediately affected by ecological stresses on the Northern Plains. This Early Archaic big game economy of the Decker area seems to have placed little if any emphasis upon the vegetal resources that Mulloy (1958) indicated were characteristic of the Plains Archaic (Middle Prehistoric Period).

Mulloy (1958:209) felt that Northern Plains populations during the Early Archaic began to increase their exploitation of vegetal resources. It is generally agreed that the presence of or an increase in ground stone implements in the archaeological record reflects such an increased dependence. Although Mulloy based his findings on the then current ideas that the plains experienced major environmental changes beginning circa 4500 B.C. (near the start of the Early Archaic) similar to the Altithermal of the Great Basin, his observations regarding ground stone implements as indicators of vegetal exploitation are

acceptable. However, the occurrence of such implements in the Decker area is rare. In fact, the 1976 survey recovered none. Moreover, Haberman (1973:67) concluded that data from the Decker area seem to indicate an importance placed on a hunting subsistence rather than collecting and gathering. Frison (1970:28) also arrived at this conclusion after excavations at the Kobold Site. Ground stone implements were absent in all four levels of the site. Fredlund and Fredlund found milling implements at the Benson's Butte excavations, but in their report they made no distinction between the Early and Late Archaic. As a consequence their evidence is vague and inconclusive (1975:10). Eco-zone selection preferences during the Early Archaic, then, seem to have been based primarily on the exploitation of faunal resources. It is conceivable that various vegetal products were also used but not to the extent that these activities are reflected in the archaeological record.

A complete seasonal exploitation pattern in the Decker area during the Early Archaic is difficult to formulate from the present evidence. The project area lies between the Tongue River Valley and the Big Horn Mountains some thirty miles to the west. Elevations vary from approximately three thousand feet in the lowlands to over thirteen thousand feet in the mountains. Loendorf (1970), working with a similar situation in the nearby Pryor Mountains, postulated a transhumant pattern of seasonal occupation of differing micro-

environments that existed throughout the range of topographic relief. It is likely that Early Archaic inhabitants of the Decker area left their wintering areas (probably in the Tongue and Powder River Valley environs) during spring months, following the bison herds as they migrated into the early maturing foothill and mountain pastures. In the Decker area, it appears that upland eco-zones were occupied only briefly as the nomads migrated through during the spring months. Summer occupation was spent in and near the mountain areas. As range and weather conditions began to deteriorate toward summer's end, both bison and human populations began moving into the lower elevations. It is at the stage (late summer) of the cycle that the Decker area appears to have been occupied most intensely during the Early Archaic. This conclusion was derived from the evidence at Benson's Butte and the Kobold Site.

Frison (1970:28) postulated that most of the Early Archaic buffalo jumping activities at the Kobold Site occurred during the late summer and fall. Since buffalo jumping required planning and communal cooperation, it is possible that preparations were made during the summer months that culminated in major bison procurement activities prior to the onset of winter. At Benson's Butte, Fredlund and Fredlund (1975:31) concluded from seed remains that the primary season of occupation was late summer.

While Frison (1970:28) proposed that Early Archaic

peoples exploited the Decker area with varying intensity throughout the entire year, it is suggested that such exploitation was intensified during the early spring and late summer months. The former season saw migrations through the area as nomads moved into the higher elevations of the Big Horn Mountains. By late summer, these populations had moved back into the Decker area and begun securing food stores in preparation for the onset of winter. Eco-zone utilization was primarily confined to the upland zones. Winters were spent in the large river valleys to the east and north.

#### Late Archaic Period

Jennings (1974:128) used as one of his criteria for the Archaic Period a subsistence base that varied from season to season as it focused on one ecosystem and then another. In other words, Archaic populations on the plains became more widely exploitive (Jennings 1974:127). There is reason to believe that a similar situation occurred in the Decker area during the Late Archaic Period.

Sixty-two percent of the occupation sites identified during the 1972 and 1976 surveys contained Late Archaic components. Furthermore, these eight sites occurred in a variety of eco-zones, including the Creek Terrace, Lower Slope Fan/Terrace and Moist Slope Ponderosa Pine zones. In addition, another Late Archaic component site, the Oelklaus Site (24BH1620) was identified in the Scoria/

Sandstone Outcrop eco-zone, but outside of the project area. It is not reported in detail in this report. Of the eight dated sites, four were located in the Moist Slope Ponderosa Pine zone, two in the Lower Slope Fan/Terrace and two in the Creek Terrace eco-zone. Benson's Butte (Dry Slope Ponderosa Pine) and the Kobold Site (Scoria/Sandstone Outcrop) each contained Late Archaic components.

This variance in eco-zone selection preferences is in contrast to the preceding prehistoric period (Early Archaic) when the upland zones seem to have been preferred. This variety suggests an intensified subsistence strategy in the Decker area that involved a variety of eco-zones ranging from the lowland to the upland zones. Evidence marshalled by Reeves (1973) indicates the possibility of minor climatic fluctuations on the Northern Plains beginning during the latter stages of the Early Archaic. This phenomenon may have induced changes in Late Archaic subsistence strategy.

Reeves' (1973:1231) data supports the contention that a large reduction in the extent of the short grass prairies existed during the time span circa 2500 B.C. until circa 750 B.C. These reductions were caused by the shifting of dominant weather patterns and a subsequent reduction in annual rainfall over the Northern Plains. This should not be construed as a dramatic environmental change that forced abandonment of the Northern Plains by man and beast alike. Rather, since bison were best adapted to the short grass

prairies (Reeves 1973:1228), it appears that there may have been significant reductions in bison populations at this time (Reeves 1973:1231). In fact, Reeves (1973:1231) suggested that the changes were of sufficient magnitude that they were important selective factors in the evolution of modern forms of bison. Short grass prairie has dominated the Decker area since Big Game Hunter times. It seems likely that the 1750 year period between circa 2500 B.C. and circa 750 B.C. saw a reduction in short grass forage throughout the Decker area, bringing with it dwindling bison populations. There is some reason to believe that these concomitant changes may have been cyclical (Reeves 1973:1224) and did not persist continually.

With cyclical reductions in bison populations, the big game hunter economy of the Early Archaic probably began a gradual transition to a subsistence base less dependent on buffalo. Precisely what these changes involved remains somewhat obscured but it appears that smaller game animals and some vegetal resources were exploited. It is probable that bison remained an integral part of the economy. There was a marked increase in ground stone implements in Archaic levels at Benson's Butte. These data would indicate an increase in plant resource exploitation, probably throughout a wide range of eco-zone types. However, because of the lack of ground stone implements in open occupation sites dated to the Late Archaic, these observations are incon-



clusive.

It is possible that during the Late Archaic pre-historic populations began an increased utilization of small game resources. Many of the small game species' habitats are confined to the lower eco-zones. This might explain the presence of Late Archaic sites in and near the creek bottoms. Excavations at site 24BH1602 uncovered faunal remains (deer or antelope). This Late Archaic site lies in the Moist Slope Ponderosa Pine eco-zone which is a favored protective eco-zone for small game ungulates. Faunal remains from 24BH1595, another Moist Slope Ponderosa Pine site, indicates bison preparation occurred in this upland zone. For the Porcupine Site (24BH1614), it was hypothesized that the extensive breaks and draws provided a desirable hunting spot for small game animals.

In all likelihood, subsequent investigations will find that a combination of vegetal and small game resource were important supplements to the bison procurement economy of the Late Archaic. It is known from Kobold III that Late Archaic populations continued to exploit bison, however reduced in numbers they might have been, but it is also apparent that supplemental subsistence activities led to intensified zonal exploitation and utilization of an expanded variety of eco-zones.

This interpretation of the Late Archaic in the Decker area would require modifications in the existing temporal

scheme as proposed by Mulloy (1958). His chronology seems to rather arbitrarily place the beginning of the Late Archaic at A.D. 1. Reeves (1973:1231) devised a chronology that places the Early Archaic in the time span between circa 5500 B.C. 1500 B.C. This leaves temporal parameters for the Late Archaic at 1500 B.C.-A.D. 500. I feel that this interpretation, in light of recent evidence, is much more reasonable. In the first place, it allows a thousand year transition period on the Northern Plains (2500 B.C. 1500 B.C.) for any cultural changes precipitated by the reduction of short grass prairie in extent and quality. The earlier parameter also accommodates the Late Archaic component at the McKean Site. This component is dated at  $1337 \pm 600$  B.C. (Frison 1970:32). The earliest date (582 B.C.) from the Late Archaic component at the Kobold Site also fits well into the revised scheme. Under Mulloy's chronology, these dates would have placed characteristically Late Archaic assemblages in the Early Archaic Period. Moreover, the revised scheme increases the duration of the Late Archaic by 1500 years (for a total of 2000). This is convenient inasmuch as it allows a temporal explanation for the apparent increase in numbers of Late Archaic sites when compared to antecedent and subsequent assemblages. Of the eighteen datable sites from the project area (of all types), ten were assigned to the Late Archaic. Eleven of the twenty-one dated occupation sites discovered by Locendorf, et al. and Haberman

in the Decker area were Late Archaic sites (Haberman 1973: 73). Without an increased time span, such an increase in site frequency could only be explained by population growth, an explanation that seems doubtful given the nature of the proposed subsistence base in the Late Archaic. Finally, the revised time span does not seem to be arbitrarily fixed; it reflects the onset of cultural and environmental dynamics on the Northern Plains (and for the Decker area in particular) and has the potential to accommodate chronologically similar change elsewhere.

Statements regarding the seasonal exploitation of varying eco-zones during the Late Archaic are based on the concept of transhumance proposed for the preceding prehistoric periods. With fluctuations in bison populations during the Late Archaic, it seems reasonable to assume that the transhumant cycle may have been modified but not totally abandoned. At the onset of cyclical drought conditions much like those that have occurred historically on the Northern Plains, it could be expected that Late Archaic peoples might begin to take advantage of the various eco-zonal resources. Frison (1970:32) proposed that these cycles (in the Decker area) might have been periods of several hundred years when buffalo were scarce and more emphasis was placed on small game. Such fluctuations in bison populations might have disrupted the transhumant cycle dependency upon bison to the extent that additional time (compared to Early Archaic scheduling) would

have to be spent in subsistence activities throughout a variety of eco-zones. Also, it may be that, unlike the cycle proposed for Early Archaic times, utilization of the Decker area continued at an even pace throughout three (spring, summer and fall) if not all four seasons. During more stable times, perhaps the prehistoric occupants took advantage of increased bison populations at the expense of the supplemental strategies and the cycle continued. At any rate, it is suggested that the Late Archaic populations in the Decker area possessed adaptive capabilities that allowed them to cope with cyclical environmental instability and the concomitant changes in economic resources. When marginal conditions prevailed, the subsistence strategy reverted to maximum exploitation of the resources supported by the entire range of eco-zones. During stable times, a transhumant cycle much the same as that of earlier times was utilized.

#### Late Hunter Period

Only two of the eleven (18 percent) post-Big Game Hunter Period occupation sites discovered in the project area could be accurately assigned to the Late Hunter Period. One (24BH1052) was classified by artifact typology; the other (24BH1610) was assigned a date by radiocarbon dating. This compares to six reliably dated occupation sites from the Late Archaic. Haberman's (1973:73, 80) site inventory from in and around the project area indicates that Late

Hunter occupation sites are generally fewer in number when compared to similar sites from the Late Archaic Period. Out of eighteen reliably dated sites, eleven were identified as Late Archaic and seven as Late Hunter components. I suggest that Haberman's larger sample is probably more representative of Late Hunter site frequency than the apparent dramatic decrease reflected in the project area alone. The latter condition is no doubt due in part to the sampling errors that often plague smaller surveys of this type. Haberman (1973:81) further noted that his data are limited, especially for the Late Hunter Period. This condition may result from the possibility of limited utilization of the Decker area as it is reflected in transitional Late Archaic/Late Hunter buffalo jumping activities.

From the third century A.C. and continuing until the end of the first millenia, there is no evidence of bison jumping in the Decker area. Buffalo jumping resumed at the Kobold Site circa A.D. 1000 and did not even begin until circa A.D. 1400 at the Foss Site (Frison, Wilson and Wilson 1974:116). The Foss Site (24BH1001) is a Late Hunter jump site just south of Decker. There is, of course, the possibility of other jumping sites in the area that have not been discovered or reported. Also, other bison procurement methods such as pounds, bison traps and pedestrian hunters armed with bow and arrows may have been employed during these times. But it does seem rather incongruous that a big game

oriented economy would abandon bison jumping, a dependable procurement method, for such a length of time. Although these facts are far from conclusive, they hint at minimal exploitation of the Decker area for a seven hundred year period. This interpretation helps explain the reduction in site frequency during a period when increases in human populations on the Northern Plains have been proposed. This time gap is further accentuated by the sudden reappearance circa A.D. 1000 and subsequent persistence until near historic times of bison jumping in the Decker area.

It is not clear why the Decker area should experience a decrease in the intensity of exploitation as it is proposed for the latter stages of the Late Archaic and including the initial five hundred years of Late Hunter times. It is possible that environmental fluctuations that began to affect cultural-ecological relationships as early as circa 1500 B.C. (beginning of the Late Archaic) reached serious proportions in the Decker area circa A.D. 300. During this time span the short grass prairies of the Northern Plains appear to have been greatly reduced in area. This caused concomitant fluctuations in bison populations (Reeves 1973:1231). But, by circa A.D. 3500 to 400, a gradual return to conditions similar to the stable Early Archaic scenario began (Bryson and Wendland 1967:294). From his research in Southeastern Wyoming, Wells (1970:185) also detected a trend toward an increase in Plains environmental stability beginning, at

the latest, circa A.D. 295 (1735 $\pm$ 80 B.P.). Although Wells felt that the trend was toward slightly more aridity, he is in agreement with Bryson and Wendland regarding environmental stability trends. From the lack of buffalo jumping during the seven hundred year period it would seem that the trend toward stability in the Decker area was quite slow.

Apparently stability trends on the Great Plains culminated in more dependable summer precipitation cycles circa A.D. 900 to 1200 (Bryson and Wendlund 1967:294). These favorable conditions coincide nicely with the reemergence of buffalo jumping in the Decker area circa A.D. 1000. This would indicate that environmental conditions had improved to the extent that bison hunting once again became a dependable subsistence strategy and that human populations began to exploit the Decker area in a regular fashion. Until this time, however, it seems likely that prehistoric populations maintained a subsistence strategy very similar to that which had developed during the less stable Late Archaic Period. This is reflected in the variety of eco-zones that are associated with Late Hunter occupation sites in the Decker area.

Research and survey investigations indicate that Late Hunter Period occupation sites crosscut at least five eco-zones. Loendorf et al. (1972) identified several Late Archaic sites in the Decker area but only one Late Hunter occupation site. From the description, the latter (24BH1029) may be assigned to the Lower Slope Fan/Terrace eco-zone. Site

24BH1029 is a tipi ring site.

Haberman (1973:37-39, 55-56) described two Late Hunter occupation sites that contained small side-notched points. Each site was located in a differing eco-zone. Site 24BH1053 lay in the Scoria/Sandstone Outcrop and 24BH1063, a tipi ring site, along the Lower Slope Fan/Terrace system. An additional occupation site outside the project area (24BH1620) contained both corner-notched and small side-notched projectile points (figures 12b, f). This site lies in the ecotone between the Dry Slope Ponderosa Pine and Scoria/Sandstone Outcrop zones. The 1976 survey revealed Late Hunter occupation sites in the Creek Terrace (24BH1052) and Lower Slope Fan/Terrace (24BH1610) eco-zones. These six sites represent those that could be reliably dated by either typological or radiocarbon dating methods. There are numerous other occupation sites in and surrounding the project area that are less reliably dated to Late Hunter times but they are not discussed herein because of their uncertain temporal affiliations.

Of four single component Late Hunter Period sites identified by Gregg (1977), each was located in a differing eco-zone. From the site descriptions these eco-zones appear to correlate well with the Upland Prairie (24BH1005), Scoria/Sandstone Outcrop (24BH1015), the Moist Slope Ponderosa Pine (24BH1568), and the Creek Terrace (24BH1624) zones. A Late Archaic/Late Hunter multi-component site (24BH1018)



lay in the Dry Slope Ponderosa Pine eco-zone. Gregg's vegetal communities differ from those proposed here so there may be some specific discrepancies in the cross association, but the basic premise that Late Hunter sites tend to crosscut a variety of eco-zones is substantiated by his data.

Inasmuch as the Late Hunter time span (A.D. 500 to A.D. 1800) for the Decker area was probably influenced by ecological conditions in a state of transition from instability to stability it is reasonable to hypothesize that eco-zone preferences may also have been modified. It is proposed that maximum utilization of a variety of eco-zones characterized the initial stages of the Late Hunter times and that the variety of zones associated with the entire Late Hunter archaeological record is mostly a product of that utilization. This interpretation does not represent a major change from the earlier prehistoric period (Late Archaic) wherein a big game hunter economy was supplemented primarily by small game subsistence strategies and to a lesser extent, vegetal resources. Because of the slow trend toward ecological stability that began circa A.D. 300, there is no reason to believe that the Late Archaic subsistence base reverted immediately or permanently at the beginning of the Late Hunter Period to a big game economy with little or no dependence on supplemental subsistence strategies. In fact, the archaeological record from the Decker area suggests that

maximum zonal exploitation did not begin to wane until A.D. 1000 when the big game bison economy apparently experienced a resurgence.

No doubt the acquisition of the bow and arrow circa A.D. 500 facilitated maximum eco-zone exploitation in the Decker area. Haberman (1973:88) suggested that this technological advancement helped provide the impetus for a settlement pattern shift from the upland to the lowland eco-zones. However, there is little reason to believe that such an obvious advantage would cause prehistoric peoples to abandon some eco-zones in favor of others, particularly at a time when maximum zonal exploitation was most intense. In fact, it seems logical that the acquisition of the bow and arrow would encourage utilization of a variety of eco-zones. Proceeding on the premise that Late Archaic peoples in the Decker area were already exploiting the entire eco-zone assemblage, it is not unreasonable to hypothesize that the bow and arrow not only facilitated but enhanced differential exploitation. Indeed, the bow and arrow may be viewed as a cultural adaptation resulting from ecological stresses near the end of the Late Archaic Period.

Following the resumption of bison jumping throughout the Decker area and the implied increased dependence on buffalo, eco-zone selection preferences may have been more a function of seasonal occupation than maximum exploitation subsistence strategies. There is no reason to believe that

the Decker area was not occupied on a seasonal basis during initial Late Hunter times, but apparently the transhumant cycle during these times did not regularly include the area. This is reflected in the low Late Hunter occupation site frequencies. Cyclical variations in small game resources due to depletion/rejuvenation cycles caused by maximum exploitation strategies may have also contributed to this irregularity. In any event, when the area was utilized it may have been seasonally opportunistic throughout all seasons rather than confined strictly to specified seasons in the transhumant cycle, although there is presently no way to conclusively demonstrate this. But by A.D. 1000 some regularity in the seasonal transhumant cycle that included the Decker area might be implied by the return of buffalo jumping practices. It is likely that this cycle generally included lowland ecozone utilization during the spring months and upland exploitation during the late summer and fall months. The general cycle is examined first.

As bison herds departed the lowland winter pastures during early spring in favor of summer foothill and mountain pastures in the Big Horn Mountains, so did the small Late Hunter bands depend upon them. An added attraction of the alpine environment were the early ripening vegetal resources such as berries, roots and tubers (Loendorf 1970). The Decker area was occupied during the spring months as the nomads passed through.

Following the summer season in the foothills and mountains, Late Hunter peoples migrated with the bison as they returned to the lower elevations. By late summer and early fall, group sizes in the Decker area had increased to effect successful communal hunting expeditions designed to secure food stores for the impending winter. It was probably during this time that the greatest exploitation of the area occurred. As winter approached, and after securing the winter supplies, the inhabitants probably disbanded into smaller groups and moved further east and north into the larger, protected valleys of the Tongue, Powder, Big Horn, and Yellowstone River systems. Although Haberman (1973:88) was not primarily concerned with the concept of transhumance, he found evidence that a transhumant model is valid for the Decker area.

To what extent the transhumant cycle may have waned during the latter stages of Late Hunter times is problematical. Most certainly the introduction of the horse facilitated the hunt. But more importantly, the horse allowed rapid and easy transportation of big game animal carcasses to the campsite. This advantage would have greatly reduced if not eliminated the necessity of transhumant cycles dependent on bison. To some extent, use of the bow and arrow might have facilitated procurement throughout the entire transhumant cycle, but it is doubtful that this technological advancement drastically altered the cycle. The transhumant

lifestyle, then, was probably abandoned in the Decker area after the introduction of the horse.

During late Late Hunter times, eco-zone utilization was probably most intense during spring, late summer and fall months. It is apparent that the primary tasks carried out at Late Hunter occupation sites in the Decker area were involved with butchering and related activities. Two heavily used sites suggest that lowland eco-zones may have been favored spots for butchering activities. At the Whoop-up and Yell Site (24BH1610), testing operations revealed extensive deposits of butchered bison bone. It was determined that butchering operations at this site were carried out during April or May. While faunal evidence from the South Fork Bottom Site (24BH1052) does not allow precise seasonal determination, it is apparent that extensive butchering activities occurred there. Both sites are in lowland eco-zones. Two other lowland eco-zone tipi ring sites (24BH1029 and 24BH1063) contained little lithic debitage and no faunal remains so it must be assumed that they functioned as something other than butchering areas.

In contrast, Late Hunter occupation sites that occur in the upland eco-zones rarely contain faunal remains and exhibit tool assemblages indicative of non-butchering activities such as hide preparation. The Oelklaus Site (24BH1620) contained scrapers, knives, choppers and bifaces (figures 12b-i) but no surface faunal remains. A similar tool assemblage was recovered from the El Ranch Site (24BH1053) (Haber-

man 1973:37-39). Both of these are located in the Scoria/Sandstone Outcrop eco-zone. Another undated site (24BH1593) from the Upland Prairie eco-zone contained several tools, including an awl that would suggest clothing manufacture, but no faunal remains. Other sites reported by Gregg (1977) with utilitarian tool assemblages but no faunal remains and occurring in upland eco-zones fit the pattern well. Scrapers, gravers, spokeshaves and awls were discovered at 24BH1018, a Dry Slope Ponderosa Pine eco-zone site. Similar assemblages occurred at 24BH1005 in the Upland Prairie zone and at 24BH1015 (Scoria/Sandstone Outcrop). Although there probably exist exceptions to these regularities, the survey and research endeavors have not identified any Late Hunter sites that absolutely invalidate these observations.

Since there is evidence of bison butchering during the spring months at 24BH1610, spring transhumant patterns during this late prehistoric period undoubtedly consisted of some bison procurement. Site 24BH1610 probably represents a butchering area remote from the kill site and it is suggested that selected portions of the bison carcasses were removed to the site for detailed butchering. If this interpretation is correct, then it lends credence to the supposition that the lowland eco-zones were preferred areas for springtime butchering activities. However, this evidence is scanty and in need of supplemental confirmation. At any rate, as the transhumant cycle progressed into summer, Late

Hunter exploitation of the Decker area was probably sporadic at best and with no zonal preference. Haberman (1973:88) suggested that the area was not utilized at all during the summer months. Late summer saw the return of bison herds to lower elevations (including the Decker area) and with them, organized groups engaged in communal bison procurement activities, primarily bison jumping. These and related fall activities quite possibly were restricted to the upland eco-zones. After securing the winter food supplies, it appears that hide preparation for clothing, shelter and other domestic items commenced as the groups split up and proceeded into the protected river valleys where shelter, fuel and other winter resources were most easily acquired. These domestic preparations appear to have been undertaken in the zones that provided shelter from inclement autumn weather.

### Lithic Scatter Sites

#### Big Game Hunter Period

To date there have been no recorded findings of projectile points or other evidence typologically characteristic of the Big Game Hunter Period found in association with Decker area litter scatters. What surface specimens that have been found were isolated finds devoid of other cultural associations. These data are discussed in conjunction with occupation sites. From this discussion it is apparent that exploitation during the latter stages of this early prehistoric period was infrequent, opportunistic and confined to

the upland eco-zones where large game animals were most easily procured.

### Early Archaic Period

The only lithic scatter site from the project area typologically representative of the Early Archaic is 24BH1619 (Terrace Site). The projectile specimen found here (figure 12a) resembles the Hanna type, a type often considered as part of the McKean continuum. The Terrace Site is located in the Scoria/Sandstone Outcrop eco-zone among numerous juniper and pine. This temporal/zonal affiliation fits well with the pattern discerned in the occupation site analysis for the Early Archaic Period. Upland eco-zones seem to have been preferred by these big game hunters for the variety of faunal resources they supported. Although it appears that the Terrace Site was primarily utilized for core reduction of porcelanite from nearby outcrops, the projectile point specimen suggests utilization of the Scoria/Sandstone eco-zone for hunting purposes. It seems likely that most of the chipping debris resulted from knapping activities subsequent to the Early Archaic utilization.

An additional McKean continuum specimen was collected from the surface of 24BH1610 near a pine and juniper-covered draw. Intense activity at the site apparently occurred only during Late Hunter times, but the McKean specimen (figure 15a) suggests an earlier hunting expedition. Although the site is



situated in the Lower Slope Fan/Terrace eco-zone, the pine and juniper-covered draw is similar to the larger upland and breaks and draws that provide protective habitats for deer and antelope.

#### Late Archaic Period

Of the four datable lithic scatter areas from the project area, only one (24BH1611) is assignable to the Late Archaic. A projectile point specimen from the site (figure 19a) is remarkably similar to specimens from Kobold Level III dated from near the beginning of the Christian era. This would place 24BH1611 in the latter stages of the Late Archaic. The specimen, from the Lower Slope Fan/Terrace, suggests utilization of the lowland zone for hunting purposes. This interpretation is in accordance with the observation that Late Archaic occupation sites occur throughout a variety of eco-zones.

#### Late Hunter Period

The two Late Hunter lithic scatter sites in the project area (24BH1583 and 24BH1606) occur in differing eco-zones. The former lies in the Scoria/Sandstone Outcrop, the latter in the Moist Slope Ponderosa Pine eco-zone. Occupation sites dated to the Late Hunter Period seemed to crosscut a variety of eco-zones and these two lithic scatter areas conform to this pattern. Site 24BH1606 was radiocarbon dated at  $290 \pm 115$  B.P. which would seem to place it in the terminal stages of

Late Hunter times. Site 24BH1583 was dated on the basis of the presence of a small side-notched projectile point.

Although classified as a lithic scatter area, there is some justification for regarding 24BH1583 as an occupation site. The site is less than two hundred feet from an habitable rock shelter (24BH1584) that did not exhibit surface evidence of occupation. It is possible that 24BH1583 functioned in conjunction with the rock shelter. This, coupled with the presence of several non-diagnostic bifaces might indicate post-butcherer activities (there were no surface faunal remains) such as hide preparation occurred here. This would conform to the hypothesis that Late Hunter occupation sites in the upland eco-zones functioned as autumn hide preparation areas. Extensive excavations at the rockshelter would be necessary to substantiate the proposed relationships.

#### Chipping Station Sites

Chipping station sites were discovered in five of the seven project area eco-zones. Excluded were the Creek Bottom and Dry Slope Ponderosa Pine systems. It is believed that these site types will eventually be discovered in the remaining zones because they do not seem to be restricted to any preferential pattern. Most likely, the restricted survey area prohibited locating chipping station sites throughout their true zonal range.

Because only two of the thirteen project area chipping stations were able to be assigned to a prehistoric time period, it is difficult to propose temporal patterns in zonal utilization. The earliest chipping station site (24BH1592) dated from the Early Archaic Period and was located in the Upland Prairie eco-zone. This association conforms to the observation that Early Archaic sites seem to be restricted to the upland zones in general. The other dated site (24BH1586) lay in the Moist Slope Ponderosa Pine eco-zone. It was assigned to the Late Hunter Period.

It is proposed that because of the brief and transient nature of chipping stations, there were no definitive zonal/temporal preferences and as a result, specific patterns cannot be established. However, collectively and without regard to temporal associations, the Upland Prairie eco-zone seems to contain the most chipping station sites. There were four chipping stations in this zone and three in both the Moist Slope Ponderosa Pine zone and the Lower Slope Fan/Terrace eco-zone. Two were discovered in the Scoria/Sandstone Outcrop eco-zone and one in the Creek Terrace system. In general terms, nine of the thirteen sites were discovered in the upland eco-zones; the remaining four lay in the lowland zones.

Because chipping station sites occur throughout a variety of eco-zones it does not seem that they functioned as lookout areas where lone hunters awaited passing game. It is assumed that lookout areas would have been located on

or near prominent features with some camouflage. This is simply not the case with many of the chipping station sites so an alternate explanation for the occurrence of these site types might lie in their proximity to larger occupation sites. Specifically, some chipping stations are located nearly adjacent to occupation areas (e.g., 24BH1592, 24BH1596) and it is suggested that the chipping activities resulted from domestic chores performed at those occupation sites. Others may have functioned as lookout areas but this interpretation would be dictated primarily by topographic salience.

#### Quarry Sites

Utilized quarry sites, by their very nature, have no intrinsic cultural/environmental relationships with the eco-zones concept as do some other sites. It is true that the most desirable quarry areas are located at the higher elevations but this is more a function of geologic processes than cultural selection according to eco-zone preference. The upland quarries were exploited most heavily because of the abundant quality material that was available. Other lowland quarries (e.g., 24BH1616) were less abundant and probably exploited on an opportunistic basis only.

#### Petroglyph Sites

Petroglyph sites are confined to the Scoria/Sandstone Outcrop eco-zone because these areas provide the only suitable surfaces for this type of rock art. This associa-

tion can be misleading, however. There is evidence that much of the non-artistic archaeological record at petroglyph sites is not affiliated with the perpetrators of the rock art. At 24BH1046 (Spring Creek Petroglyphs) typological and radiocarbon dates suggest exploitation of the area as early as two thousand years ago. There is some question as to whether the petroglyph panels can be associated with this early date. Certainly those that depict horses cannot. Thus, there is always the possibility that a portion of the remains from petroglyph sites in the Decker area might best be examined within a functional/temporal/eco-zonal perspective. This approach seems to be particularly apropos for the Spring Creek Petroglyphs.

The typological and radiocarbon evidence indicates utilization of the Scoria/Sandstone Outcrop eco-zone during the latter stages of the Late Archaic. It is difficult to assess the function of this earlier occupation but some possibilities include shelter or hunting endeavors. In any event, utilization of this eco-zone fits the pattern established in the Late Archaic occupation site analysis. It appears that during these times, maximum exploitation of a variety of eco-zones was underway, thus one might expect to find a Late Archaic component in this area. There is also the possibility that some of the rock art was carved on the sandstone faces near the close of the Late Archaic, but this association is tenuous at best.

### Medicine Wheel Sites

Like quarry sites, eco-zone preference does not appear to be a controlling factor in site selection for medicine wheels, although topographic prominence seems to be an essential factor. Probably for ceremonial reasons it was necessary to select areas that afforded a commanding view of the countryside but specific reasons are not known. The wheel at 24BH1617 is located atop a prominent hill that allows a view for many miles in all quadrants. In the Decker area, however, this does not seem to be a standard requirement. A medicine wheel near Sheridan, Wyoming and another near the mouth of the Big Horn Canyon are situated on terraces overlooking only the nearby river valleys. The former does provide a spectacular view of the Big Horn Mountains. Topographic factors, then, rather than eco-zone criteria, controlled the selection of medicine wheel sites in the Decker area.

### Vision Quest Sites

A situation similar to the selection requirements for medicine wheel is also applicable to vision quest sites in the Decker area. There does not seem to be any consideration of eco-zone factors other than topography. The main requirement for questing locations seems to be the selection of a prominent landscape feature. In the Decker area, such site areas do not conform to Wedel's (1961:266) contention

that the location of vision quest sites be nearly inaccessible. Good (1975:78) also recorded sites that were located on prominent features but were easily accessible. These observations were recorded during investigations in the foothills of the Pryor Mountains. In light of the Decker area evidence and Good's observations, ideas regarding the location of vision questing sites might be in need of revision. Certainly remote, inaccessible areas in the Big Horn and Pryor Mountains were utilized as questing areas (Wedel 1961; Connor 1967) but so too were lower prominent, but easily accessible areas. These differences in location might possibly reflect different requirements for different rituals or merely completion of ritual requirements without regard to inaccessibility criteria.

### Rockshelters

Only one habitable rockshelter (24BH1584) was recorded in the project area. Although this site did not exhibit cultural remains, it is believed that it was utilized, possibly in conjunction with a nearby lithic scatter site (24BH1583). This might account for the absence of lithic scatter at the shelter. Also, hard, compacted dung layers obscured the sandy floor of the shelter.

From evidence derived from excavations at other rockshelters near the Decker area, it is obvious that these site types have the potential to provide an excellent stratigraphic

record or prehistoric occupation for at least the past two thousand years. This observation is attributed to the fact that rockshelters probably provided excellent shelter for prehistoric inhabitants regardless of time period. Although rockshelters are by their very nature confined to the Scoria/Sandstone eco-zone, one might expect to find a wide range of temporal types in association. Therefore, it is difficult to make definitive statements regarding temporal/eco-zonal regularities on the basis of evidence from rockshelters alone. In fact, one might expect that data from rockshelters could possibly not conform to observed temporal/zonal regularities simply because of the singular selection criterion of shelter. Therefore, data from rockshelters should be applied to the eco-zonal model with caution.



## CHAPTER VII

### CONCLUSIONS

It is incumbent upon archaeologists conducting investigations under the rubric of cultural resource management to approach their contractual obligations with a problem-oriented framework. In this manner, contract archaeology can serve not only the best interests of management (industry and agency) but also the demands of the archaeological community. Research within the proposed Spring Creek Mine Project area reflects this kind of orientation. But of what utility are analyses and hypotheses derived from investigations within an arbitrarily restricted and relatively small area such as the project area? It is suggested that such research can provide a viable framework within which future archaeological investigations can be carried out. The framework, or simply the eco-zonal model and derived hypotheses, are valuable to investigations on a regional basis.

It is difficult and, in my opinion, unwise to delimit specifically a region within which the Spring Creek eco-zonal model and hypotheses might be applicable. Common sense alone generally restricts utility. It certainly would be foolish to investigate the archaeology of the Canadian tundra armed with the Spring Creek model. Likewise, future investigators

might find this research irrelevant to the ecological conditions (past and present) a scant thirty miles from the project area nearer the Big Horn Mountains. Yet, some of the ideas presented in this thesis could be applied to pre-historic cultural/ecological relationships as distant as southern Wyoming. So, regardless of location, eco-zone maintenance factors (e.g., slope, climate, topography, soils) must approximate those found in the project area. Then the Spring Creek research might prove to be a valuable aid. But this should be left to the discretion of the informed archaeologist as he exercises his judgment without the obstruction of arbitrarily fixed regional boundaries.

This thesis also frequently referred to the "Decker area" without specifically establishing what lands comprised that spatial concept. I feel that the caution exercised in specifically establishing limits of regional application applies also the delineation of the Decker area. Obviously, the latter is spatially restricted within the regional concept but it serves no purpose to delimit (arbitrarily or otherwise) the area with boundaries. Archaeologists involved in future investigations near Decker can determine to what extent the analytical concept of "Decker area" cultural/ecological associations can facilitate their research. No doubt these investigations will demonstrate that the eco-zone assemblage identified in the project area is not completely inclusive for the Decker area. Also, by

imposing limits to the concept of space in prehistory, the likelihood of impeding rather than facilitating research is enhanced. Therefore, spatial limitations remain purposely vague.

With this in mind, several hypotheses derived from archaeological investigations for the Spring Creek Mine area may be advanced. These generalizations may be tested without regard to specific regional boundaries provided the ecological setting is approximately equivalent to that which exists(ed) in the Spring Creek Project area. The hypotheses are:

1) The eco-zone model is valid and greatly facilitates archaeological research in the Decker area.

2) The eco-zone assemblage identified within the project area is not necessarily inclusive for the entire Decker area and surrounding region.

3) Specific regularities in prehistoric land utilization of the Decker area through time can be observed. These include:

- a) an upland eco-zonal preference during the late Big Game Hunter and Early Archaic prehistoric periods. These preferences seem to have been fostered by the abundant big game resources characteristic of the upland zones.
- b) By Late Archaic times there began an intense exploitation of the entire eco-zone assemblage with little if any preferential selection.

This phenomenon appears to have been caused by cyclical instability in the entire ecological setting (e.g., climate, flora, fauna) of the area.

- c) The Late Archaic ecological conditions persisted, although on the wane, into the initial stages of the Late Hunter Period. As a consequence, cultural adaptations remained typical of Late Archaic times until circa A.D. 1000 when buffalo jumping in the Decker area resumed. The latter stages of Late Hunter times were characterized by ecological stability and eco-zone selection preferences that were related to seasonal economic endeavors.

4) To elucidate temporal/eco-zonal relationships a formal site type classification must be established. In this analysis, only those sites formally designated as occupation, lithic scatter and chipping station sites exhibited temporal regularities in eco-zone preferences.

5) Many site types are not situated according to strict eco-zone selection criteria. These include rock-shelters, medicine wheels, petroglyph sites, and vision quests. Topographic salience seems to be the chief selection factor in these instances.

6) The archaeological record in the Decker area reflects Reeves' (1973) interpretations of prehistoric ecological conditions on the Northern Plains. The record does not support popular notions of a Northern Plains altithermal period from circa 5000 B.C. to 2500 B.C.

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